NETWORK WORLD
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# Novell taking NetWare to object level

**By Timothy O'Brien**
West Coast Bureau Chief

BOSTON — To spur development of networked applications, Novell, Inc. said at last week's NetWorld 93 Boston conference that it will work with HyperDesk Corp. to develop a uniform, object-based interface to NetWare services and resources.

Novell and HyperDesk will jointly build NetWare Loadable Module (NLM) versions of HyperDesk's Distributed Object Management System (HD-DOMS) for NetWare 3.X and future releases. As part of their deal, Novell will acquire 20% of HyperDesk.

HD-DOMS will serve as both a development language and platform-independent object management system, and will give application developers a common interface to NetWare services without needing to know where the services are implemented across a network.

"The use of HD-DOMS will allow NetWare services, resources, data and, eventually, voice and images to be treated as objects that can be accessed through

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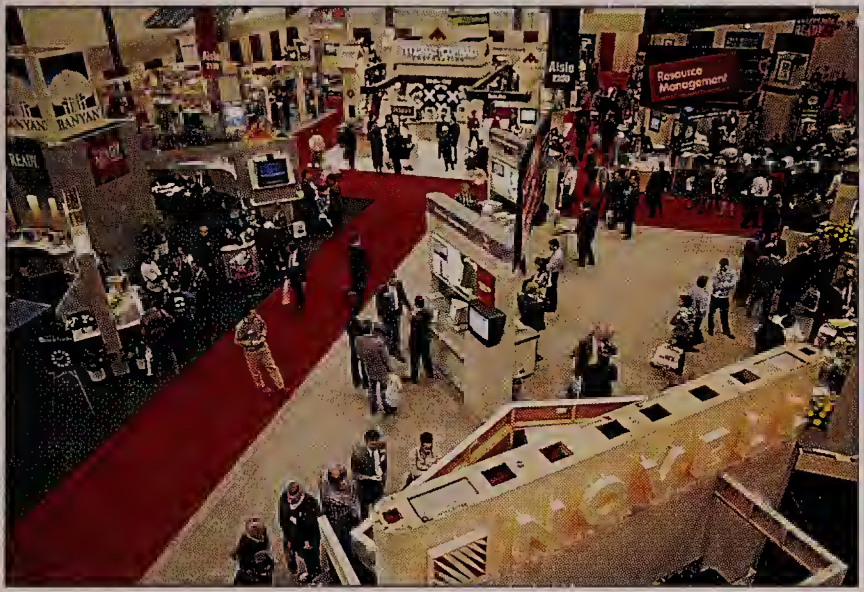

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NetWorld last week played host to announcements by Novell, IBM, Lotus and others. See coverage throughout this week's issue.

# *Scrivner prepares its SNA net for the advent of APPN*

**By Michael Cooney**
Senior Editor

OKLAHOMA CITY — Sticking with the tried and Blue, food service giant Scrivner, Inc. is laying the groundwork to move its Systems Network Architecture net into the Advanced Peer-to-Peer Networking (APPN) realm.

The revamped SNA net will carry both Token Ring-based SNA traffic and Novell, Inc. NetWare local-area network data, eliminate the need for Scrivner to upgrade or replace its 3745 front-end processors (FEP) and reduce line costs. The firm has made the IBM 6611 Network Processor and Netlink, Inc.'s SDLC Link Server the linchpins for building its new peer-to-peer SNA net.

"We have had an SNA backbone since Day One, and we intend to move toward a completely distributed network with APPN," said Bob Walker, director of technology services for Scrivner. "Our overall goals are to have a consistent, reliable

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## NETLINE

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**SNA SOFTWARE** adjusts net parameters on the fly to optimize performance. Page 5.

**HP, AT&T OFFER PEEK** into 100M Ethernet scheme, get backing from Novell. Page 6.

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NEWSPAPER
100

# Router makers strive for greater heights

Cisco, Coral go after Wellfleet Backbone Node with new high-end devices for big internetworks.

**By Maureen Molloy and Fredric Paul**
Network World Staff

MENLO PARK, Calif. — Cisco Systems, Inc. and Coral Network Corp. this week will announce new high-end routers designed to provide the speed and reliability required in large enterprise internetworks.

Analysis shows the new Cisco and Coral products will not quite match Wellfleet Communications, Inc.'s high-end entry in terms of raw numbers, such as packet forwarding rate and local- or wide-area ports supported (see graphic, page 56). But the routers will offer significant performance and reliability improvements compared to each vendor's existing products.

When released next month, the new Cisco 7000 Internetwork Router will be able to forward up to 110,000 64-byte packet/sec — an almost 50% boost over the firm's current top-of-the-line router, the AGS+.

Next year, that rate will more than double again to nearly 250,000 packet/sec.

Coral's Backbone Express (BX) 2000, meanwhile, will sup-

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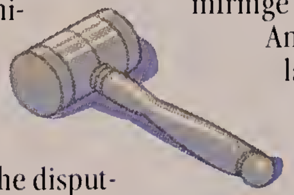
# Long haulers' patent spat raises concerns for users

**By Anita Taff**
Washington Bureau Chief

WASHINGTON, D.C. — A long-simmering fight over ownership of several major network technologies boiled over last week as AT&T filed suit against MCI Communications Corp., seeking millions of dollars in back royalty payments and damages for MCI's use of the disputed technologies.



In a filing at the U.S. District Court for the District of Columbia, AT&T last week claimed that MCI is violating 10 of its patents for technologies including virtual network service, database lookup and credit card validation. AT&T said seven of MCI's services — Virtual Network (Vnet), WATS 800 service, MCI calling card, MCI Vnet calling card, MCI's 0+ audible company logo feature, various call validation features and trunk detect/disconnect — infringe on AT&T patents.

An AT&T victory in the lawsuit would have a substantial impact on the industry. In addition to MCI, many independent local and long-distance companies, and even some customers, use the same technologies and might have to pay royalties.

The regional Bell holding companies have the right to use

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## INSIDE

The road to 32-bit operating systems is paved with a rich set of built-in network functions, but eager users need to step very carefully. Page 40.

# ODS weighs in big with Infinity hub

**By Skip MacAskill**
Staff Writer

BOSTON — Optical Data Systems, Inc. (ODS) revealed its vision of third-generation hubs with the NetWorld 93 Boston introduction of a line of high-density concentrators with integrated switching capabilities and multiple modular backplanes.

The new Infinity hubs support Ethernet, token-ring and the Fiber Distributed Data Interface (FDDI) and will eventually gain a separate backplane for Asynchronous Transfer Mode (ATM), an enhancement ODS is expected to detail early next month.

The Infinity rollout moves ODS to the head of the intelligent hub class in terms of the number of local-area networks, backplanes and user ports supported, claimed Terry Gaston, vice presi-

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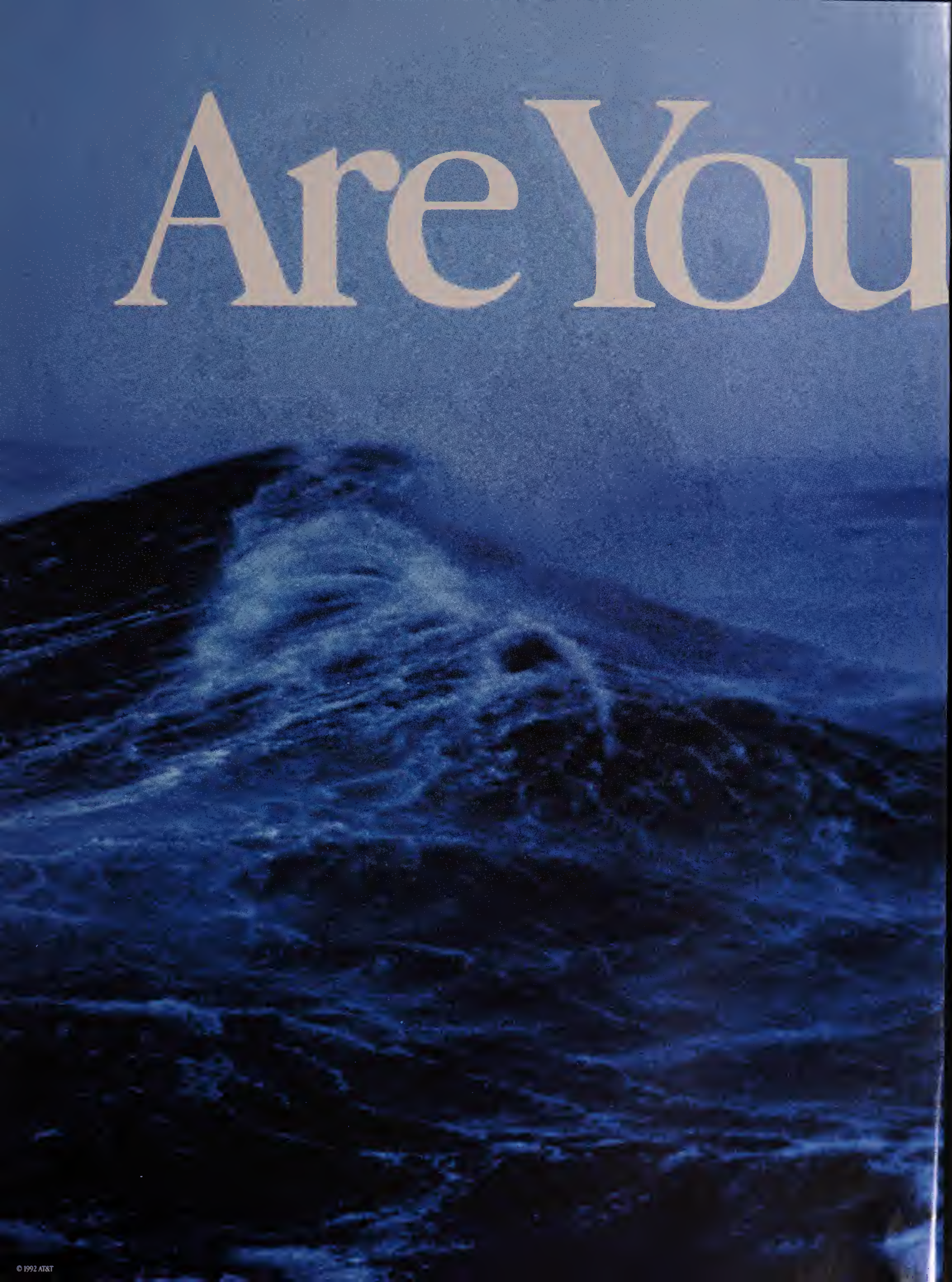

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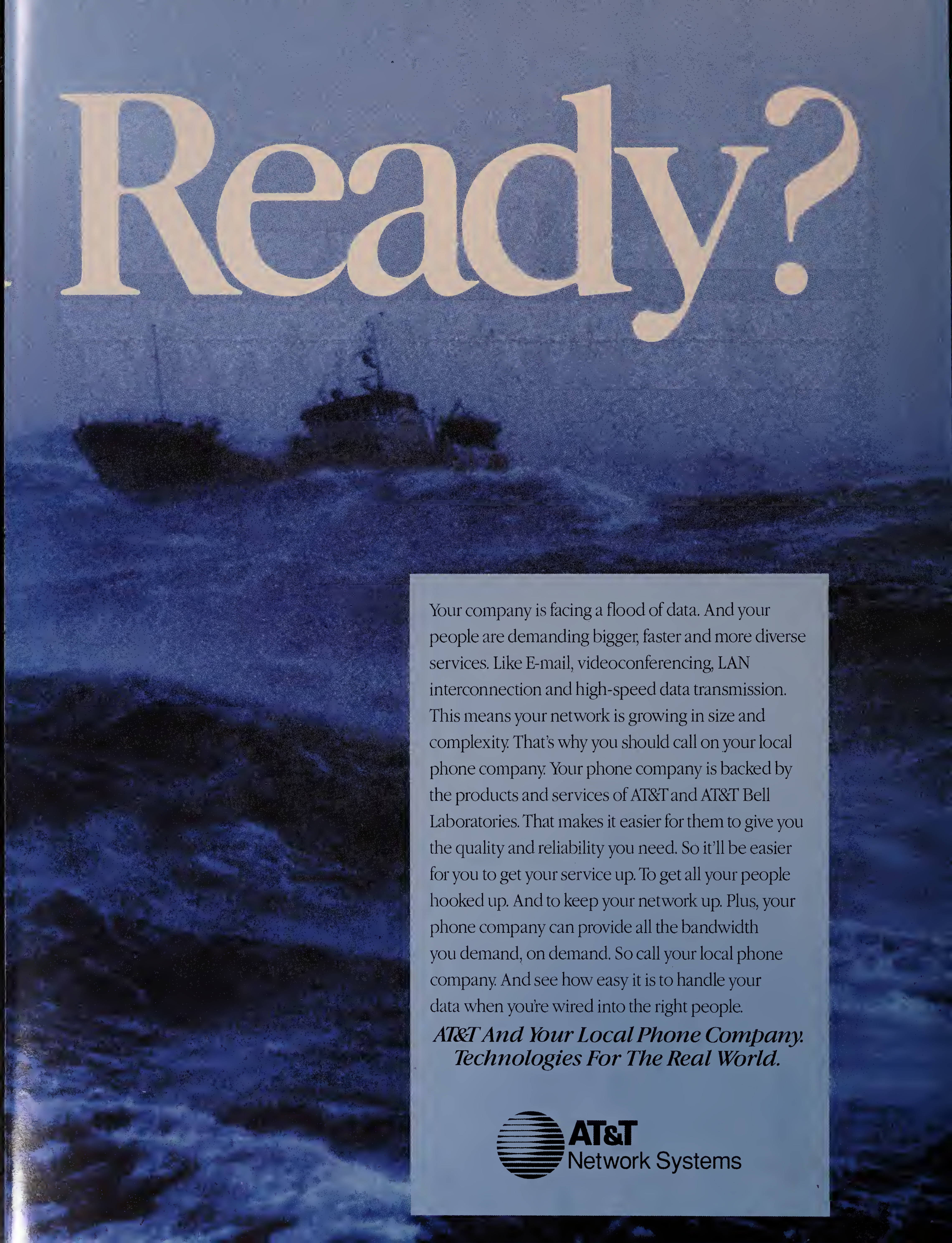
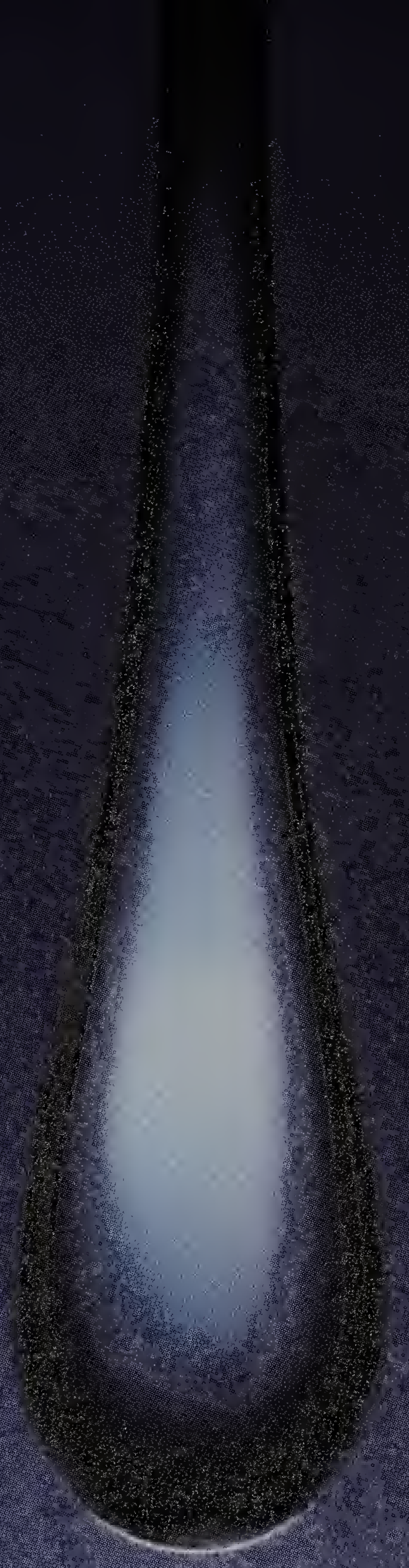


# Ready?

Your company is facing a flood of data. And your people are demanding bigger, faster and more diverse services. Like E-mail, videoconferencing, LAN interconnection and high-speed data transmission. This means your network is growing in size and complexity. That's why you should call on your local phone company. Your phone company is backed by the products and services of AT&T and AT&T Bell Laboratories. That makes it easier for them to give you the quality and reliability you need. So it'll be easier for you to get your service up. To get all your people hooked up. And to keep your network up. Plus, your phone company can provide all the bandwidth you demand, on demand. So call your local phone company. And see how easy it is to handle your data when you're wired into the right people.

***AT&T And Your Local Phone Company. Technologies For The Real World.***

**AT&T**
Network Systems



There's evidence your
broadband needs are becoming much
more than a drop in the bucket.

# Carriers reveal the how of ATM but not the when

## Information on infrastructure provided while users continue to wait for service and pricing strategies.

**By Bob Wallace**
Senior Editor

Three of the four leading long-distance carriers last week detailed the network infrastructure they will use to offer Asynchronous Transfer Mode (ATM) services but pulled up short on details about when the services would be available.

WilTel and Sprint Corp. said they will offer ATM services by year end. AT&T would only say "soon."

While information about switch platforms will be of some help to users, it is a far cry from what is needed for long-term planning, the lack of which is causing consternation in the user community ("To users' dismay, carriers mum on ATM service plan," *NW*, Jan. 11).

**Start talking services**

"I've been trying for months to get meaningful information on carriers' ATM plans, but don't have much to show for it," said Bill Horst, a computer specialist with the General Services Administration in Philadelphia. "Carriers need to start talking services as well as availability and pricing."

*(continued on page 59)*

# Future of NetWorld is a hot topic at the conference

## Name change raises questions about LAN show.

**By Bob Brown**
Senior Editor

BOSTON — What's in a name? The sponsors of the NetWorld conference are finding out the hard way.

While the NetWorld 93 Boston local-area network conference and exposition attracted some 30,000 people last week, the event's pending name change and future direction dominated discussion on the show floor.

At issue was the expiration of Bruno Blenheim, Inc.'s right to use the NetWorld name for its trade shows in Boston and Dallas, and speculation that NetWorld cornerstone Novell, Inc. will not exhibit at the shows next year.

Novell, which owns the rights to the NetWorld name, has licensed the name instead to Interop Co., the Mountain View, Calif.-based organization that runs the INTEROP trade shows. Interop announced shortly before the NetWorld show here last week that it planned to rename its show NetWorld+INTEROP to address both LAN and enterprise network professionals.

Bruno Blenheim said it would rename its show "Networks Expo" and expand the focus to

*(continued on page 60)*

# New software dynamically tunes SNA nets on the fly

**By Michael Cooney**
Senior Editor

SUGAR LAND, Texas — BMC Software, Inc. last week introduced SNA front-end processor software that can measure network performance and adjust FEP parameters on the fly to pump up network throughput and reduce response times.

BMC's Opertune for NCP automatically changes parameters on the FEP's Network Control Program (NCP) as traffic patterns dictate, thereby increasing throughput in some cases by more than 200% and reducing response times by 70%, company executives said.

Typically, net managers have to shut down the FEP and manually code parameter changes to NCP — a process that could leave users in the dark for hours. NCP is the operating system software for IBM's 37XX FEPs.

"Opertune eliminates trial-and-error tuning and responds to real-time SNA network conditions," said David Schwee, software manager of network products for BMC.

"Manual tuning requires analysts with specialized knowledge of NCP parameters and equip-

*(continued on page 57)*

# Briefs

**FCC allocates little LEO spectrum.** The Federal Communications Commission last week allocated 4 MHz of radio spectrum below 1 GHz for use by low-earth orbit (LEO) satellites dubbed "little LEOs" to support wireless personal communications services for paging, tracking and limited data transmission. The FCC said it intends to issue little LEO operating licenses by the end of the year.

**Ameritech, university begin wireless Centrex test.** Ameritech last week said it has begun a trial of wireless Centrex with the University of Chicago. During the trial, the participants will use lightweight, pocket-size telephones to receive and place calls, as well as perform intercom calling and call rerouting.

**BT launches caller ID trials in the U.K.** BT last week announced the beginning of caller identification trials with businesses and residences in the U.K., saying that successful trials could lead to deployment of the service throughout the country. The BT trial will involve about 500 customers in the Elgin area of northern Scotland.

**OURS offers software licensing models.** Open User Recommended Solutions (OURS), a nonprofit group chartered to improve multivendor computing, last week issued a white paper on software licensing that offers models for equitable licensing practices in multivendor network environments. The group issued a request for comment on the paper and will be issuing a final draft at its next meeting in March. For more information or a copy of the paper, contact Elaine Bond, OURS president, at (718) 242-3411.

**Making information policy a priority.** The Computer Systems Policy Project, an organization of chief executive officers of the nation's largest computer firms, last week urged President Clinton to declare the creation of a National Information Infrastructure, a national priority similar to the space race of the 1960s. John Sculley of Apple Computer, Inc. said the effort would be financed in large part by the private sector but urged the government to referee in solving policy issues, setting standards and resolving competing interests.

**EFF moves and shuffles.** The Electronic Frontier Foundation (EFF) last week said it is closing its Cambridge, Mass., offices and consolidating its operations in Washington, D.C. As part of the reorganization, Jerry Berman, head of the Washington office, will succeed Mitch Kapor as executive director. EFF Cofounder John Barlow will succeed Kapor as chairman of the executive committee. Kapor will remain as EFF chairman of the board.

**Lotus offers help.** Lotus Development Corp. last week announced a Field Support Services program under which Lotus engineers will spend as many as five days at customer sites installing Notes and cc:Mail, as well as reconfiguring networks and systems to optimize the value of the Lotus products. Field Support Services, a fee-based program, can be reached at (800) 343-5414, then 2.

**InaCom to buy Sears resale unit.** InaCom Corp., a 1,200-site Omaha, Neb., network reseller and integrator, last week agreed to buy Sears Business Centers, a computer and network resale unit of Sears, Roebuck and Co. The agreement will enable InaCom to increase its geographic coverage. Financial terms of the deal were not disclosed.

## CONTACTS

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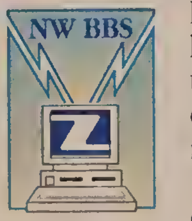

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# Novell blesses HP, AT&T scheme for 100M Ethernet

## Partners reveal details of high-speed LAN plan.

**By Joanne Cummings**
Senior Writer

BOSTON — Hewlett-Packard Co. and AT&T last week gave additional insight into their joint 100M bit/sec Ethernet plan and got some big backing for the proposal from Novell, Inc.

The news prompted supporters of other 100M bit/sec proposals, such as 3Com Corp., to underscore potential problems with the HP-AT&T scheme, which would support Ethernet at 100M bit/sec over current wiring.

HP and AT&T announced plans to develop workstation adapters that will support both 10M and 100M bit/sec speeds. This would enable users to move workstations to work groups supporting either speed without having to change adapters, said Brice Clark, strategy and planning manager for HP's Roseville Networks Division.

Clark said the new adapter would not be much different than a 10Base-T adapter and would not be very costly to manufacture. He said HP sells an Industry Standard Architecture 10Base-T adapter today for about $200 and the new 10M/100M adapter would be priced comparably.

In addition, Clark said 10M bit/sec Ethernets would be able to communicate with their 100M bit/sec counterparts via a bridge, rather than a more complex router. He said hubs supporting the new technology, called 100Base-VG, would come standard with a bridge to support this function.

HP and AT&T also said the 100Base-VG technology would work not only over voice-grade Category 3 unshielded twisted-pair wiring, like today's 10Base-T nets, but would also support fiber and IBM Type 1 cabling.

Novell's support may be a boon for 100Base-VG. Darrell Miller, executive vice president of marketing services for Novell,

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# Top IBM, Novell officials detail future DCE support

**By Caryn Gillooly**
**and Fredric Paul**
Network World Staff

BOSTON — The Distributed Computing Environment (DCE) last week got a boost as two of the industry's most influential vendors detailed plans for supporting the Open Software Foundation, Inc.'s technology platform.

At NetWorld 93 Boston here, Novell, Inc. for the first time mapped out a specific DCE direction, as well as product plans. In addition, IBM said it is continuing to provide DCE support in its product line and is currently beta-testing add-on products that would enable OS/2 to support DCE.

Novell was a late entry into the DCE picture, joining OSF less than a year ago. But William Mason, product-line manager at Novell's NetWare Products Division in Provo, Utah, said the company is working with Carnegie Mellon University to bring DCE support to NetWare in several phases.

In the first phase, Novell will bring out the NetWare Distributed File Services (DFS) Gateway, a NetWare Loadable Module that will let NetWare users transparently access the DCE Distributed File System. It also provides user authentication services.

According to Mason, this would mean a single logon and a single point of identification for access to both NetWare and DCE's DFS services.

Phase 2 of Novell's plan is to provide all core DCE services — such as remote procecure calls (RPC), security, time services and DCE threads — from within the NetWare server.

The success of Phase 2, Mason stressed, will directly affect the implementation of the next phase, under which Novell may release DFS-enabled NetWare —

*(continued on page 61)*

# Industry giants lukewarm on DCE

BOSTON — While Novell, Inc. and IBM expressed support for the Distributed Computing Environment (DCE) at last week's NetWorld 93 Boston show, two other industry giants, Microsoft Corp. and Banyan Systems, Inc., were more cautious about the technology.

Microsoft, although it has made a commitment to the Open Software Foundation, Inc.'s (OSF) DCE, said DCE is just one component of its distributed computing strategy. "DCE is not the entire solution," said Richard Barth, product manager for Windows NT. "It's a piece of the puzzle," along with other technologies such as Sockets and Named Pipes.

Still, Microsoft is a member of OSF and participated in formulating the DCE Phase 1 standard. DCE remote procedure calls (RPC) have been shipping since last July in the Windows NT Software Developers Kit, Barth said, and the second release of Windows NT will support DCE's Security Service and Directory Service.

Banyan has even more reservations about the value of DCE.

"As a source of technology, we're not that excited about DCE," said Bob Nuber, Banyan's director of product strategy. Since most of it overlaps with existing Banyan technology, there's little added value, he said, although Banyan does have some interest in DCE's security services and RPCs.

Banyan has also been disappointed about DCE as an application standard.

"We were very optimistic, but now we're not so sure," Nuber said. "It doesn't seem to be offering the value expected." It's not that DCE has changed, Nuber explained, but that other technologies have come along, such as Microsoft's Messaging Application Programming Interface and Apple Computer, Inc.'s Open Collaboration Environment.

To date, Banyan's only public commitment to DCE is to support X.500 for directory interoperability.

On the other hand, Banyan has been pleasantly surprised by DCE's potential for interoperability, especially among systems vendors. IBM, Hewlett-Packard Co. and Digital Equipment Corp. seem to be more committed than Banyan expected. "There's motion there," according to Nuber.

Banyan hopes to leverage DCE technology developments where possible, closely monitor adoption of DCE by other vendors and "jump on" any interoperability opportunities with systems vendors, he said.

*Fredric Paul*

# *DOD sets ambitious goals for new messaging system*

**By Ellen Messmer**
Senior Correspondent

WASHINGTON, D.C. — The U.S. Department of Defense has unveiled its blueprint for the military's next-generation desktop messaging system, but its planners are wondering whether industry can build it.

Based on a military-specific version of X.400 with an X.500 directory, the Defense Message System (DMS) is designed to replace the Automatic Digital Network (AUTODIN) for worldwide delivery of both classified and nonclassified communications starting this year.

But the innovative security features in DMS raise basic questions: Will it be compatible with garden-variety X.400, and will vendors be willing to implement the new National Security Agency (NSA) encryption algorithm for DMS.

The Defense Department plans to issue a request for proposal for DMS in August. But DMS architects last week said they need input from the industry before moving ahead on such a large project with profound national security implications.

The DMS — expected to serve more than a million users, including fighting forces at remote sites — calls for a secured version of the 1988 X.400, called P772, for the Military Message Handling System. The Consultative Committee on International Telephony and Telegraphy approved the P772 extension to the 1988 X.400 at the request of NATO, which includes the U.S.

P772 specifies a military-specific X.400 user agent known as the Organizational User Agent. P772 contains seven precedence levels for priority routing of messages, as opposed to the three priority levels in the garden-variety 1988 X.400 user agent.

The department wants to run P772 over a full Open Systems Interconnection stack, with gateways to the Transmission Control Protocol/Internet Protocol, Simple Mail Transfer Protocol and AUTODIN.

The DMS will require classified P772 messages to be en-

*(continued on page 61)*

# AT&T offers a mid-range package deal

**By Bob Wallace**
Senior Editor

BASKING RIDGE, N.J. — AT&T last week announced a service aimed at mid-range business customers that combines 800 and outbound calling capabilities, and offers unified billing and support.

UniPlan is targeted at customers that spend between $24,000 and $1 million a year on long distance. The service enables them to combine AT&T 800, International 800, Calling Card, Megacom Plus, Megacom and 800 Readyline traffic under a single bill for discounts up to 32% off total annual usage.

Sites can use either dedicated or switched access to UniPlan. In cases where customers opt for T-1 access, channels not used to access UniPlan services can support other AT&T switched and private-line services.

Firms that use switched access will pay $0.2245 a minute for calls to sites in a 292-mile band during peak calling hours — 8 a.m. to 5 p.m. — and $0.1797 for off-peak calls. Users with dedicat-

*(continued on page 60)*

## Get in touch with the R.A.F.

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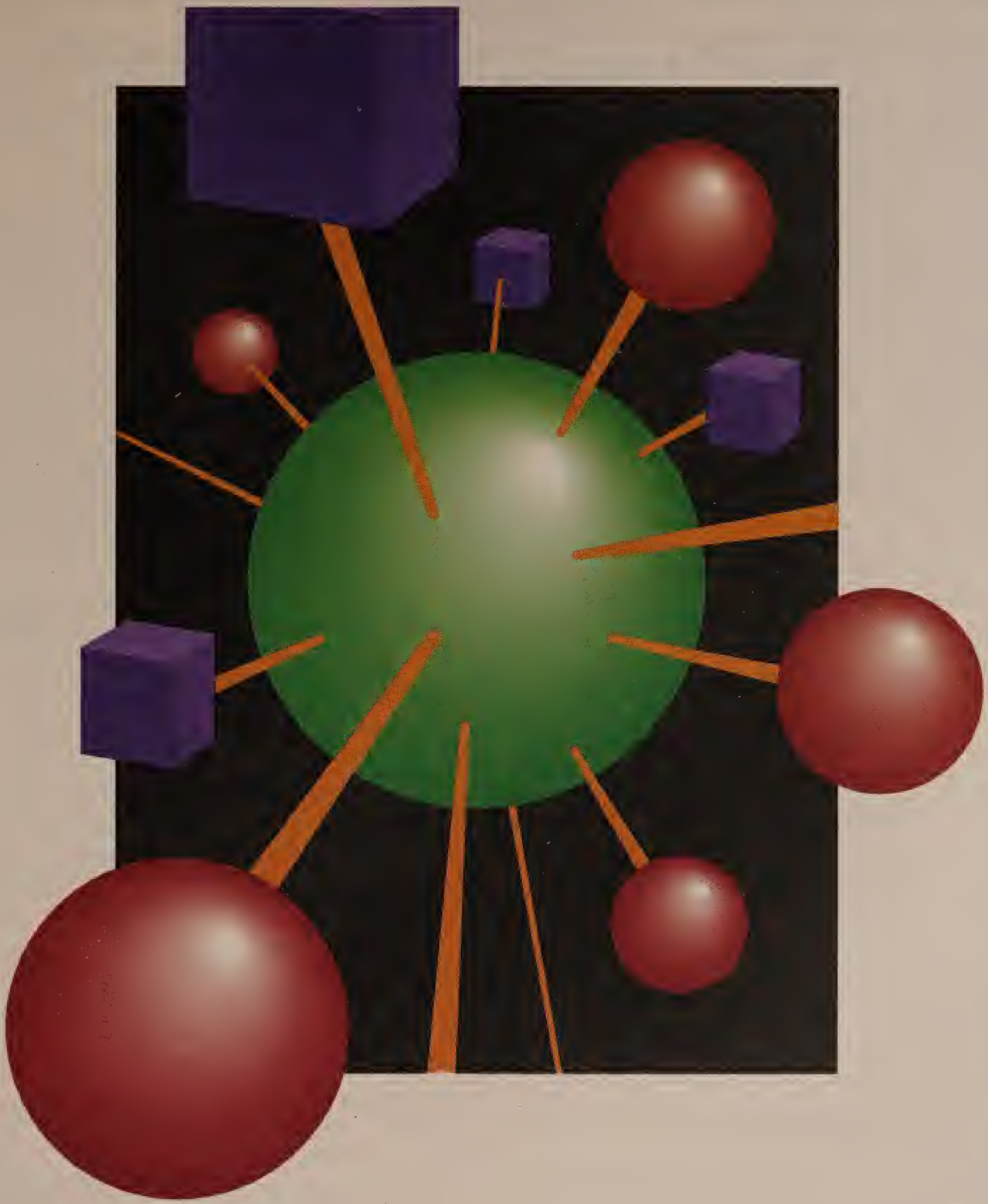

# AT LAST, A HUB THAT TRULY IS THE CENTER OF YOUR NETWORK.

It's here. The new advanced routing ODS-Infinity™ intelligent hub. A hub so powerful and flexible, it does in a single chassis what it used to take a dozen units to do.

The new Infinity can single-handedly manage Ethernet, Token Ring and FDDI simultaneously. It offers by far the greatest capacity of any hub today, and it can switch and route ports and work groups to wherever you need them. Superior scalability, switchability, and routing from one powerful platform. It's about time a hub lived up to its name.

Of course, if great network management is what you want from a hub, the Infinity offers the most graphically vivid and sophisticated standards-based management on the market today. Not to mention, a truly fail-safe design that ensures your network performs reliably around the clock, year after year. And, the Infinity is designed with an open platform so it can accommodate today's technology and make room for tomorrow's.

If you're looking for a hub that really is the core of your network, call ODS at (214) 234-6400 today. We're not looking to steal all the attention with our new hub. We just want to be the center of it.

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# Lotus-led coalition backs XAPIA message API effort

**By Bob Brown**
Senior Editor

BOSTON — The Vendor Independent Messaging (VIM) Interface group last week followed Microsoft Corp.'s lead and threw its weight behind an industrywide effort to develop a simple, standard messaging API.

The VIM Interface group offered to support a set of messaging application program interfaces — dubbed Common Mail Calls — being developed by the X.400 API Association (XAPIA), an electronic mail vendor consortium that has worked on APIs for X.400 nets.

The VIM Interface group, an eight-vendor team led by Lotus Development Corp. to establish a common high-level messaging API, also announced it was opening its ranks to other parties.

Messaging APIs are sets of function calls used by developers to write mail-enabled applications. The emergence of messaging APIs from rival vendor camps has raised interoperability concerns among users and confusion among developers, both of whom have pushed E-mail vendors to agree on a single API.

With backing from Microsoft, XAPIA last summer decided to work on a set of simple messaging APIs that will enable applications to exchange messages using various mail engines. Microsoft had pitched its own API as a possible standards base, a move that was viewed by some as a peace offering and by others as a marketing ploy designed to put the VIM Interface group on the spot.

The VIM Interface group kept mum on the Microsoft proposal initially but expressed support for XAPIA's decision to broaden its charter to include the simple messaging API standard.

(continued on page 44)

### Vendor Independent Messaging Interface group

- ☐ Apple Computer, Inc.
- ☐ Borland International, Inc.
- ☐ IBM
- ☐ Lotus Development Corp.
- ☐ MCI International, Inc.
- ☐ Novell, Inc.
- ☐ Oracle Corp.
- ☐ WordPerfect Corp.

SOURCE: VIM INTERFACE GROUP
GRAPHIC BY TERRI MITCHELL

# Lotus details its Notes 3.0 release plans

**By Wayne Eckerson**
Senior Editor

BOSTON — Lotus Development Corp. last week detailed several Notes 3.0 features that will ship in March, including support for new LAN and WAN protocols, and confirmed that some expected features will not be available until later in the year.

At NetWorld 93 Boston here, Lotus officials also unveiled a long-term strategy for integrating applications with network services. The Lotus Communications Architecture builds on three core Lotus products — Notes for distributed document databases, cc:Mail for messaging and DataLens for data access — that will be used to network-enable desktop and work group applications using published application program interfaces (API) and other industry standards.

To help make it a key part of that new architecture, Notes 3.0 will support drivers for five new protocols: Novell, Inc.'s Internetwork Packet Exchange/Sequenced Packet Exchange (IPX/SPX), IBM's Systems Network Architecture, Apple Computer, Inc.'s AppleTalk, the Transmission Control Protocol/Internet Protocol and X.25. Current versions of Notes support only IBM's Network Basic I/O System and Banyan Systems, Inc.'s VINES protocols.

In addition, Notes 3.0 will offer new API calls to support document sharing, message-based work flow and many new administrative capabilities.

But Lotus officials said a Notes driver for Lotus' DataLens data access tool, which had been expected in the initial release, will not be available until this summer.

The SNA driver works only on OS/2 Notes servers or clients, and its primary role will be to support server-to-server communications. The AppleTalk driver works only with Macintosh clients and OS/2 Notes servers, while the IPX/SPX drivers work with Microsoft Corp. Windows and OS/2 workstations. All protocols will be bundled into Notes 3.0, except TCP/IP, which will be priced separately.

Notes 3.0 will also add a new set of API calls between Notes and desktop applications, known as the Document Management Interface, which will enable groups of Notes users to simultaneously view and edit the same document.

(continued on page 61)

### New features in Lotus Notes 3.0

**Notes 3.0, due out in March, adds support for:**

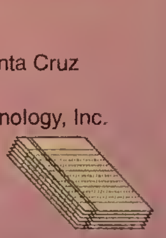
- Apple Computer, Inc. Macintosh clients
- Drivers for IPX/SPX, TCP/IP, AppleTalk, X.25, SNA
- A Document Management Interface in the Notes application program interface for group-enabling spreadsheets, presentations and other documents
- Microsoft Corp's Open Database Connectivity specification
- Message-based work flow using predefined rules or filters
- Text search and retrieval using Verity, Inc. technology
- Option of using cc:Mail as Notes mail client
- Consistent user interface between Notes mail and cc:Mail for Windows 2.0
- Replication that occurs in background while user performs other work
- Automatic synchronization of design changes across multiple Notes databases
- Administrative enhancements such as automatic alarms, a hierarchical naming structure based on X.500, a macro language for creating action scripts and remote consoles for managing Notes servers
- New packaging, including availability of Notes clients separately and a work group edition comprising 1 server and 9 clients for less than $5,000

**Notes 3.X, due out this summer, adds support for:**

- Unix clients and servers running on IBM's AIX and Sun Microsystems, Inc.'s Solaris operating systems
- Open Software Foundation, Inc.'s Motif and Hewlett-Packard Co.'s OpenLook graphical user interfaces
- Drivers for Lotus' DataLens tool, which provides access to 35 databases

**Notes 3.XX, due out by year end, supports:**

- NetWare Loadable Modules based on NetWare 4.0
- Windows NT
- Notes clients and servers running on HP's HP-UX and The Santa Cruz Operation, Inc.'s Unix processors
- Document-based work flow using technology from Action Technology, Inc. (sold separately as a Notes companion product)
- OS/2 Workplace Shell



GRAPHIC BY TERRI MITCHELL
SOURCE: LOTUS DEVELOPMENT CORP., CAMBRIDGE, MASS.

# Gupta revs up development tool for client/server apps

## New version lets teams develop distributed apps.

**By Wayne Eckerson**
Senior Editor

MENLO PARK, Calif. — Gupta Corp. last week raised the ante in PC-based application development with the introduction of an object-oriented version of its client/server applications development tool that lets teams of programmers build distributed applications.

SQLWindows 4.0 contains a component called TeamWindows, which lets large groups of programmers work together to design and assemble objects, such as radio buttons and dialogue boxes, that can be reused within the same or multiple applications.

With TeamWindows, a few expert programmers can develop the core objects or templates used in different applications, while the majority of programmers assemble these objects into working applications or screens, according to Umang Gupta, president and chief executive officer of Gupta, based here.

While most mainframe- and Unix-based applications development environments have long-supported collaborative computing, this capability has been absent from personal computer-based, client/server tools, Gupta said.

TeamWindows includes a centralized data dictionary and a repository for storing reusable objects. Currently, the repository is based on Gupta's SQLBase database engine, but it will eventually run on Oracle Corp. and Sybase, Inc. databases. The repository has facilities for managing changes and updates to source code, specifications and data models, security privileges, project status and staffing.

Another element of SQLWindows 4.0 is the QuestWindow, which brings the full functionality of Gupta's Quest data access tool to SQLWindows applications. The QuestWindow exists as an icon on SQLWindows tool palette, which developers can drag and drop into an SQLWindows application. Quest's point-and-click interface then lets developers build SQL queries directly into the application without writing SQL commands.

SQLWindows 4.0 also provides a true object-oriented programming environment that supports encapsulation, polymor-

(continued on page 44)

# Microsoft unveils remote E-mail client for Windows

**By Bob Brown**
Senior Editor

BOSTON — Microsoft Corp. last week introduced what it calls the first remote electronic mail client for computers running Microsoft Windows.

Microsoft Mail Remote Client for Windows was announced at NetWorld 93 Boston here along with an updated version of the Microsoft Mail server. The new client is designed to give remote and mobile users access to local-area network-based Microsoft Mail systems as well as public messaging services.

It boasts the same end-user interface offered by Microsoft for Microsoft Mail for PC Networks, reducing the need for training. Furthermore, it offers a feature that can cut phone charges by enabling users to read and create messages off-line before making a modem connection, said Reed Koch, product manager for Microsoft Mail.

Users can send messages from within other Microsoft applications, such as Word, Excel and Access. Using Microsoft's Object Linking and Embedding technology, users can also send multimedia objects, such as charts, in E-mail messages. The product offers filters that let readers selectively view mail by sender, subject or other categories.

Microsoft Mail gateways provide access from the remote product to a variety of public E-mail nets, including those from AT&T EasyLink Services, GE In-

(continued on page 44)

**Correction:** Due to incorrect information supplied by a Digital Equipment Corp. official, the story "DEC phasing out Phase IV, enhancing its DECnet/OSI" (Dec. 14, 1992) stated that DECnet-Ultrix, the DECnet Phase IV communications software for DEC's Ultrix operating system, had been pulled from the market. DEC continues to sell the product.

# A lot of companies want your ATM business. And the choice is critical.

*Which leads us to one simple question:*

*StrataCom pioneers FastPacket® fixed-length cell technology: the IPX®*

1986

*CCITT specifies ATM fixed-length cell relay technology as the foundation for all B-ISDN products and services worldwide*

1988

*StrataCom advances cell relay development by adding video and high-speed data to the IPX's voice and low-speed data capabilities*

1989

*StrataCom becomes the first company to provide fixed-length cell technology for Europe's E1 networks and subrate trunks*

1990

# Why not choose the only company with real experience behind it?

*ATM is a powerful, new technology that will change the way major corporations do business, obsoleting old network technologies, such as TDM. Sooner or later, you'll have to choose an ATM supplier.*

In 1986, StrataCom created the first commercial product based on the ATM concept of transmitting information in fixed-length cells: the IPX. Through seven years of continual innovation and improvement, we've installed more cell relay ports than all other vendors combined.

## Now StrataCom introduces the Broadband ATM Switch

Today, we are launching the natural broadband extension of our narrowband IPX. It's called the BPX, and it's the only cell relay switch that represents a second-generation product. The distinction is critical.

With StrataCom, you get the benefit of hundreds of engineering-years experience implementing cell relay solutions. We've already discovered and solved the problems that other companies don't even know exist.

The result is a powerful multi-gigabit ATM platform equipped to deliver the full benefits of ATM networking. BPX provides interfaces up to OC-12 and can drive any cell-based service, from frame relay to ATM. And of course, it's fully compliant with CCITT and ANSI standards. You won't find a more compatible, secure and economical solution for your future communications needs.

## The Smooth Road to ATM starts today

But what if you don't need broadband ATM at every location today? What if today's challenge is to increase existing application performance? We can give you that performance now and lead you smoothly into ATM when and where you need it.

Our IPX narrowband switch can give you the highest performance in cell relay applications for any type of traffic—voice, data, frame relay, video—at access speeds of 2.0Mbps and below.

And when new applications demand broadband capabilities, you can simply plug BPX anywhere into your IPX network to meet those needs. StrataCom lets you mix narrowband and broadband ATM throughout your network to get exactly the degree of performance you want for each application, at every location.

With IPX and BPX, you can communicate between the 56Kbps frame relay LAN at your sales office and the 155Mbps ATM UNI link at your headquarters.

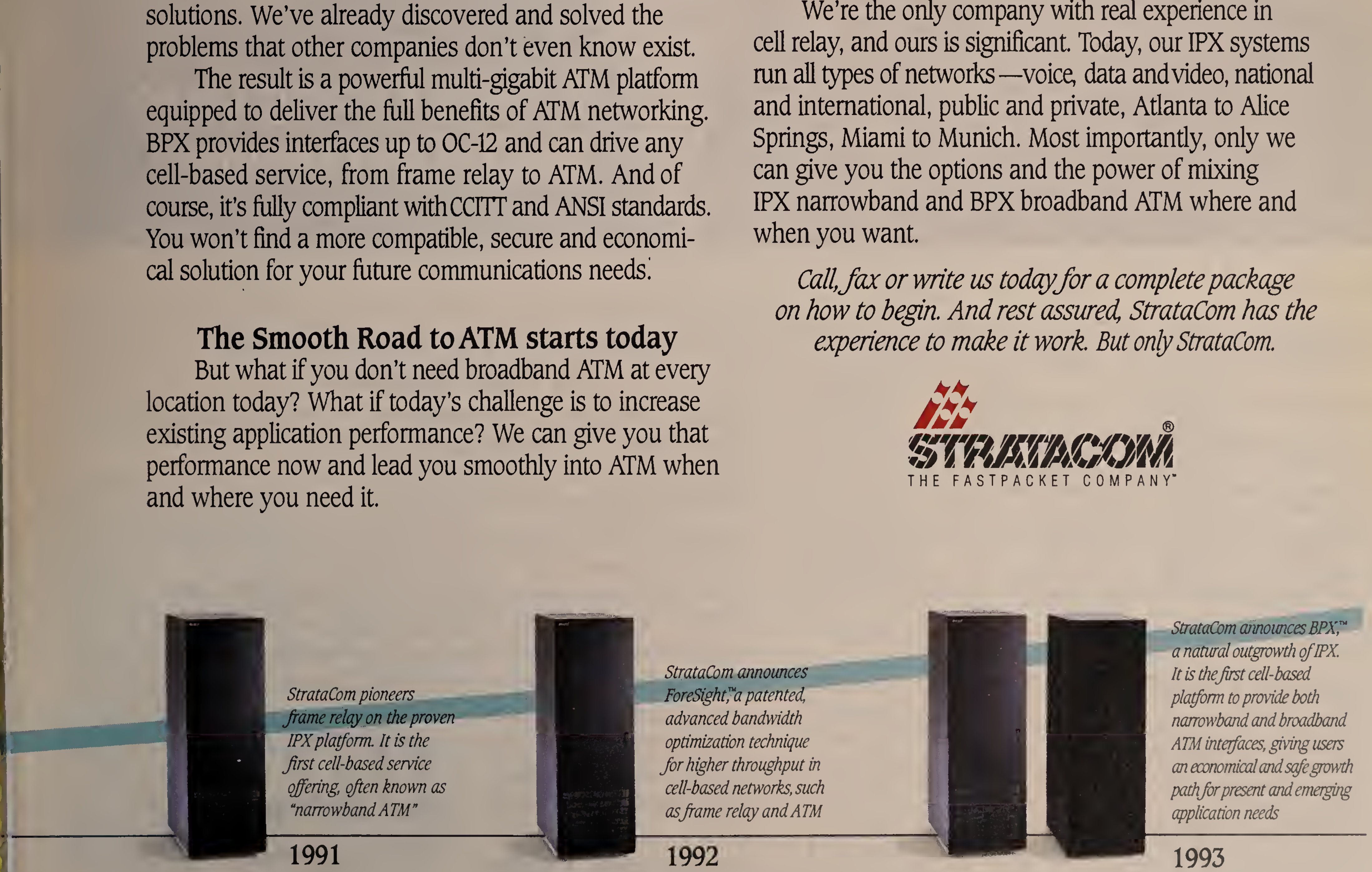
IPX to BPX is the only evolutionary path to the world of broadband. But IPX is also the smartest solution for more power and performance today.

## StrataCom, the only ATM company with a past, a present and a future

We're the only company with real experience in cell relay, and ours is significant. Today, our IPX systems run all types of networks—voice, data and video, national and international, public and private, Atlanta to Alice Springs, Miami to Munich. Most importantly, only we can give you the options and the power of mixing IPX narrowband and BPX broadband ATM where and when you want.

*Call, fax or write us today for a complete package on how to begin. And rest assured, StrataCom has the experience to make it work. But only StrataCom.*

STRATACOM®
THE FASTPACKET COMPANY™



*StrataCom pioneers frame relay on the proven IPX platform. It is the first cell-based service offering, often known as "narrowband ATM"*

1991

*StrataCom announces ForeSight,™ a patented, advanced bandwidth optimization technique for higher throughput in cell-based networks, such as frame relay and ATM*

1992

*StrataCom announces BPX,™ a natural outgrowth of IPX. It is the first cell-based platform to provide both narrowband and broadband ATM interfaces, giving users an economical and safe growth path for present and emerging application needs*

1993

*Corporate Headquarters: 1400 Parkmoor Avenue San Jose, CA 95126 (800) 537-7707, Fax: (408) 999-0115*
*European Headquarters: StrataCom, Ltd. 4 Ancells Court, Ancells Business Park Fleet, Hampshire, GU13 8UY, U.K. Phone: 011-44-252-815-554 or 011-44-252-815-413, Fax: 011-44-252-815-428*

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Finally Facing Up to Digital Datacomm?

| Model | Type | Max. Rate | Network | Features |
|---|---|---|---|---|
| SW56II | Accunet Sw. Digital | 56 Kbps | 4-wire Sw. Digital | Keypad, Autodialer |
| DU170 | Datapath Sw. Digital | 64 Kbps | 2-wire Sw. Digital | Keypad, Autodialer |
| TA110 | Terminal Adapter | 1 Ch. @ 64K<br>1 Ch. @ 16K | ISDN | X.25 PAD |
| TA120 | Terminal Adapter | 2 Ch. @ 64K<br>1 Ch. @ 16K | ISDN | Supports Voice & Data |
| TA220 | Terminal Adapter | 2 Ch. @ 64K<br>1 Ch. @ 16K | ISDN | Combines "B" Channels |
| FT100S | DSU/CSU | 56K-1.544Mb | T1/ Frac. T1 | Single Port |
| FT100 | DSU/CSU | 56K-1.544Mb | T1/ Frac. T1 | Dual Port (Expandable) |
| DDS/MR1 | DSU/CSU | 56 Kbps | DDS | All DDS Rates |
| DDS/V.32 | DSU with V.32 Modem | 56 Kbps | DDS/ Analog | Auto-dial Backup |
| T1-ESF-CSU | CSU | 1.544 Mbps | T1 | ESF & D4 Framing |
| Digital-DBU | Digital Dial Backup | 56K-1.544Mb | DDS/ Frac. T1 | Universal Digital Dial Backup |

*Quality Means The World To Us.*™

## Stick with the World Leader in V.32 Modems!

As your datacomm system migrates from analog to digital technology, you'll be looking for a reliable source of digital advice, equipment and support. You can find it with the company that has earned your confidence through years of industry leadership in analog modems.

At UDS, more than a dozen digital devices—DSU/CSUs (switched, DDS, T1, fractional T1) and ISDN terminal adapters and termination devices— are already being shipped. They are appropriate for a wide variety of applications—present and future.

As you go digital, look to UDS for applications advice, reliable products and competitive pricing. Call:

**800-451-2369**

UDS

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## Worth Noting

> "People have a voracious appetite for bandwidth. There's a perceived need [for ATM], and perceptions lead to reality."
>
> **Joel Bernstein**
> Principal consultant
> B&J Telecommunications Consultants
> Tinton Falls, N.J.

## Data Packets

Users of IBM's Professional Office System and OfficeVision/VM will be able to combine their electronic mail and Windows applications on the same screen, thanks to a new resale agreement announced last week by **Digital Communications Associates, Inc.** DCA will bundle Capella Systems, Inc.'s IRMA Smartscreen for Windows (ISW) software with DCA's IRMA Workstation for Windows (IWW) 3270 emulation software. The Capella product lets users combine PROFS and OfficeVision applications on the same screen. Users of IWW 2.1 can add ISW for free. Users of previous IWW versions can upgrade to IWW 2.1 for $95 and receive ISW free. After June 30, IWW will sell for $125.

**Attachmate Corp.** of Bellevue, Wash., has added coaxial link support to its Extra for Macintosh 3270 emulation software that lets Macintosh users communicate directly with an IBM or compatible Systems Network Architecture controller over traditional coaxial cable. The new support makes it easier for SNA users to integrate Macintoshes into SNA nets.

Extra for Macintosh Version 1.1 also adds support for light pens and improved 3270 keyboard mapping features. The product will be available this month for $425.

### Access to savings

| Application | Equipment | DS0s | Bandwidth (bit/sec) | Access type | Equipment list price | Monthly access charges |
|---|---|---|---|---|---|---|
| **Nonintegrated access:** | | | | | | |
| VPN voice | Channel bank plus CSU | 8 | 512K | T-1 | $12,500 | $500 |
| Video-conferencing | Inverse mux plus CSU | 6 | 384K | T-1 | $10,500 | $500 |
| LAN interconnect | DSU/CSU | 4 | 256K | T-1 | $3,500 | $500 |
| Low-speed terminals | 56K DSU | 1 | 56K | DDS | $2,000 | $140 |
| **Total nonintegrated access:** | | | | | **$28,500** | **$1,640** |
| **IMACS/800 integrated access:** | | | | | **$19,750** | **$500** |
| **Onetime savings with IMACS/800:** | | | | | **$8,750**<br>**31%** | |
| **Monthly savings with IMACS/800:** | | | | | | **$1,140**<br>**70%** |

**CSU = Channel service unit** **DSU = Data service unit** **DDS = Digital data service**

Premisys' Integrated Multiple Access Communications Server Model 800 (IMACS/800) can save users 31% in equipment costs and 70% in monthly access costs over nonintegrated network access devices for voice, videoconferencing, LAN interconnect and low-speed terminal applications.

SOURCE: PREMISYS COMMUNICATIONS, INC., PALO ALTO, CALIF.

# Integrated access gear lets users pick carrier services

Reduces cost of purchasing access equipment.

**By Jim Duffy**
Senior Editor

PALO ALTO, Calif. — To address a growing market for users looking to take advantage of new carrier services, Premisys Communications, Inc. last week unwrapped its flagship product, an integrated network access system.

The Integrated Multiple Access Communications Server Model 800 (IMACS/800) is aimed at users deploying T-1 lines to access switched and private-line network services. It combines the functions of channel banks, multiplexers, modems and data service units (DSU)/channel service units in a single modular chassis that can simultaneously support circuit, fast packet and cell switching.

> Each voice card handles as many as eight voice lines.
>
> ▲▲▲

IMACS/800 houses 20 parallel time-division multiplexed buses with a total capacity of 80M bit/sec. It sports as many as nine so-called application cards for attaching various voice and data networking gear, as many as four network interface cards for access to T-1/E-1 lines, and as many as three "server" cards, which support different network services.

The application cards include three voice modules for two- and four-wire connection to analog lines, and six data modules. Each voice card handles as many as eight voice lines and supports various services, such as private branch exchange connections to T-1 channels and automatic ringdown on private lines.

The data application cards include one high-speed data card with two RS-530/RS-449 ports, each of which supports synchronous data rates of 56K to 2M bit/sec in increments of 56K or 64K bit/sec. Each port is also compatible with switched 56K bit/sec digital services.

Data modules also include subrate data cards, each of which include 10 RS-232 serial ports that can each support synchronous or asynchronous communications at speeds ranging from 2.4 to 38.4K bit/sec. The subrate cards can also operate as packet assembler/disassemblers for frame relay and X.25 traffic.

Other application modules include Office Channel Unit Data Port cards. Each two-port card allows remote DSUs to communicate with the IMACS/800 over four-wire switched digital lines at speeds ranging from 2.4K to 72K bit/sec.

Each T-1/E-1 network interface card, meanwhile, supports two T-1/E-1 connections. The

*(continued on page 16)*

# StrataCom plan links frame relay, ATM

Vendor to develop gateway in order to use frame relay as a springboard for its new ATM switch.

**By Jim Duffy**
Senior Editor

NEW YORK — As expected, StrataCom, Inc. last week introduced its entrant into the high-speed broadband networking market, the Broadband-PX (BPX), and disclosed agreements with AT&T and Cisco Systems, Inc. to develop a frame relay-to-ATM gateway.

The BPX is based on a 9.6G bit/sec switching matrix and supports up to 96 ports and wide-area links of 620M bit/sec. It sports 12 slots, each with a total capacity of 800M bit/sec, that house interface cards for T-3, 45M bit/sec frame relay and Synchronous Optical Network, as well as Asynchronous Transfer Mode (ATM) ("StrataCom to stake claim in ATM frontier," *NW*, Jan. 11).

But it is the gateway, referred to by the companies as frame relay-to-ATM "interworking," that is regarded as pivotal in drawing users and carriers to the switch.

Interworking is intended to make the transition to broadband cell networking from narrowband frame relay switching seamless, StrataCom officials said. It is designed to allow companies and carriers to install ATM devices only in locations where traffic is heaviest.

"Some sites will reach ATM before others," said Thomas Nolle, president of CIMI Corp., a Voorhees, N.J., consultancy. "Users will leave their network in frame relay form for sites that can't cost-justify ATM."

According to StrataCom President Dick Moley, interworking "provides a path where you don't have to upgrade everything. If you are a public or private frame relay user, you don't have to touch your 64K bit/sec pipes or the equipment installed."

Interworking is firmware that will reside on ATM modules linking the BPX over T-3 lines with StrataCom's existing IPX switches, which are prevalent in public and private frame relay nets.

*(continued on page 16)*

# *Pack allows Net/Master to watch over NetWare LANs*

**By Michael Cooney**
Senior Editor

RESTON, Va. — Systems Center, Inc. has announced software that lets Systems Network Architecture users centrally manage Novell, Inc. NetWare local-area nets from the Net/Master enterprise management platform.

Solve: LAN for NetWare lets Systems Center's Net/Master users receive net management alerts from local or remote NetWare networks and issue diagnostic or correcting commands via a NetWare for SAA server. In the past, Net/Master's support of NetWare was limited to receiving alerts.

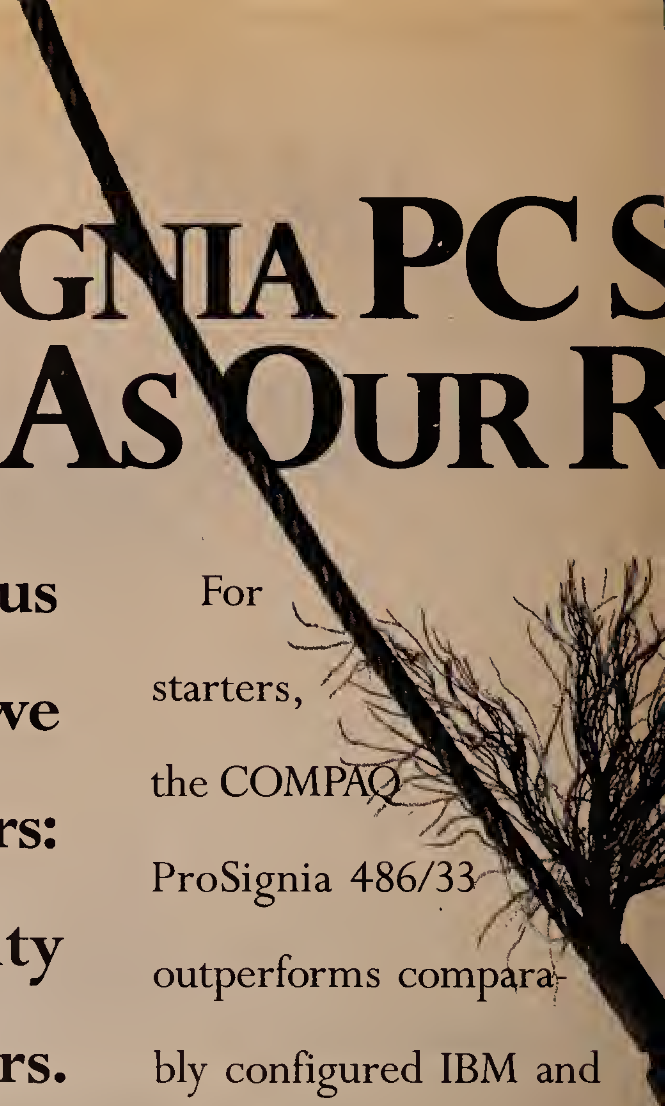
With Solve: LAN for NetWare, users can centrally monitor from a Net/Master console a variety of functions on the NetWare LAN, such as the status of LAN segments, LAN configuration changes and disk space available on clients.

"With Solve: LAN for Netware, we wanted to give the help desk the same central control over their remote NetWare LANs that they have over their wide-area SNA devices," said Dale Vecchio, director of corporate product marketing for networking at Systems Center. "We are providing them visibility into an environment they had a difficult time seeing in the past."

Solve: LAN for NetWare is mainframe software that works by accepting net management data from NetWare for SAA servers, which in turn gather data from downstream clients and generate SNA Network Management Vector Transport packets that carry the data to Net/Master. The Net/Master operator can

*(continued on page 16)*

# THE COMPAQ PROSIGNIA PC S
# THE SAME IMPACT AS OUR R



**Not long ago, we introduced PCs that established us as the new leader in affordable computing. To that we now add the COMPAQ ProSignia Family of PC Servers: delivering a new level of performance, affordability and support by establishing a new class of PC servers.**

Ironically, the more critical your PC network becomes, the more likely your network server will prove inadequate.

The faster you need something, the slower it delivers. When it's time to upgrade or expand, you find yourself at the technological equivalent of a dead-end street.

Which, needless to say, can be a problem.

What you need is an easy-to-manage system offering high performance, flexibility and extended support. All at an exceptional price.

In other words, a breakthrough.

In still other words, the new COMPAQ ProSignia.

**PROCESSORS:** *chip upgradable 486/33 or 486DX2/66* **EXPANSION:** *7 32-Bit EISA bus master slots* **STORAGE:** *over 6GB internal in 8 bays* **HARD DRIVES:** *Fast-SCSI-2 (330MB, 550MB, 1.05GB), Drive Array Pairs (680MB, 1.02GB), IDE (210MB, 340MB, 510MB)* **DRIVE CONTROLLER:** *Integrated or optional 32-Bit Fast-SCSI-2, IDA-2, or Integrated IDE (on models 1/EL and 340/W)* **NETWORK CONTROLLER:** *Preinstalled 32-Bit NetFlex Controller* **SERVER MANAGEMENT:** *INSIGHT Server Management Framework* **RAM:** *4-128MB of industry-standard SIMMS* **WARRANTY:** *Free three-year, parts and labor, on-site** warranty* **SUPPORT:** *Free 24-hour, 7-day hardware support, optional multi-vendor network operating system support.*

For starters, the COMPAQ ProSignia 486/33 outperforms comparably configured IBM and Dell servers by 83% and 64%, respectively.* (Both of which, by the way, are much more expensive.)

In not-so-simple terms, here's how we did it:

COMPAQ ProSignia disk-configured models come standard with an all-new 32-Bit Fast-SCSI-2 Controller that performs twice as fast as old SCSI technology. As well as a preinstalled, COMPAQ 32-Bit NetFlex Controller that works with Ethernet or Token Ring. And for those who require truly

©1992 Compaq Computer Corporation. All Rights Reserved. COMPAQ Registered US Patent and Trademark Office. ProSignia, NetFlex and CompaqCare are trademarks of Compaq Computer Corporation. Product names mentioned herein may be trademarks and/or registered trademarks of their respective companies. *Results from running PC Week File Server Shootout test. All products with 16 MB of RAM. COMPAQ ProSignia with integrated 32-Bit Fast-SCSI-2 Controller and four 550MB Fast-SCSI-2 Hard Drives. Dell PowerLine 450SE with Dell SCSI Controller and four 650MB SCSI Hard Drives. IBM PS/2 XP486/50 Model 95 with IBM SCSI Controller and four 400MB SCSI Hard Drives. **This service, provided

# ERVER. WE EXPECT IT TO HAVE ECENTLY INTRODUCED PCS.

extraordinary capabilities, we offer an optional 32-Bit IDA-2 Controller.

All of which means it takes a lot less time to get a lot more done. No more waiting for files. No more staring blankly at a computer screen that stares just as blankly back.

The COMPAQ ProSignia is also the first affordable PC server incorporating advanced management technologies. Included is a set of simple-to-use features that not only help you maintain better control over your entire network, but can also anticipate, and help prevent, potential problems.

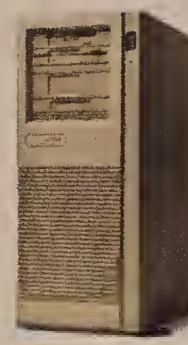
The simple translation: Fewer headaches. For you. For users. Forever.

We've even turned up the volume on our service and support program. You get a full three-year, on-site** limited warranty, as well as 24-hour-a-day, 7-day-a-week technical support. Free.

CompaqCare also now includes our optional Advanced Network Support Agreement, a comprehensive selection of systems-related support services that can be customized to meet your needs.

To learn how easy it is to get up and running, just call 1-800-345-1518 in the U.S., or 1-800-263-5868 in Canada.

You'll find out why the COMPAQ ProSignia represents such an exceptional value. And why it will undoubtedly make a big impression. On the marketplace, and on you.



*The COMPAQ ProSignia starts at under $2,700† and is designed, tested and certified to run NetWare flawlessly. We even offer NetWare from Compaq to optimize server management capabilities.*

intel inside

*With only industry-standard technologies and an easy-to-upgrade processor path, the COMPAQ ProSignia provides a cost-effective way to meet today's needs today. And tomorrow's tomorrow.*

COMPAQ

by Contracted Service Providers, is specific to hardware products and may not be available in certain geographic locations. Consult the Compaq Customer Support Center for details. †Suggested retail price; reseller price may vary; price indicated is for non-disk-configured COMPAQ ProSignia 486/33 Model 1/EL, not pictured here; monitor, NetFlex Controller not included. Models including hard drive and NetFlex Controller start under $4500. The Intel Inside logo is a registered trademark of Intel Corporation.

## Pack lets Net/Master watch over LANs

*continued from page 13*

send commands back the same way or use Net/Master's automation routines to enable the system to automatically respond to certain alerts.

For now, Solve: LAN for NetWare passes alerts and alarms only to Net/Master, but Vecchio said the product will eventually run on IBM's NetView, although he could not say specifically when.

Analysts said the enhanced NetWare support will help Systems Center more effectively compete in the enterprise manager arena.

"For users of centralized management platforms, how much management information the platform can extract from remote LAN sites is one of the biggest issues and differentiating factors between platforms," said Dick Boyle, program director for local-area communications at Gartner Group, Inc., a consultancy in Stamford, Conn.

According to Rick Villars, an analyst with market researchers at International Data Corp. in Framingham, Mass., there is an increasing number of NetWare LANs in SNA nets that many users want to centrally manage.

"Data center managers want to manage both environments from the same location, and IBM and Systems Center now offer that capability," Villars said.

The Solve: LAN for NetWare package is available for $20,000, which includes support for 10 NetWare for SAA servers. Additional server support is available at a cost of $85 to $250 each, depending on configuration.

As mainframe connectivity changes, we're all ears.

**We heard you describing your new needs in mainframe connectivity.** With ears like these, we can't help it.

You need a next generation gateway that will run across your enterprise network.

We listened — and went to work.

**The result: an Open Gateway Architecture™** that supports all major LANs and provides unprecedented management of dozens of gateways and thousands of users across your enterprise — and is also compatible with your existing gateway and emulator investments. Innovative features include high-level monitoring, resource management, hot backup, and many other advanced controls.

For ten years, Rabbit's incredibly reliable gateways for 3270, APPC, and RJE and X.25 products have been connecting users to mainframes from DOS, Windows, UNIX, and AIX operating systems.

As a leader in mainframe connectivity, Rabbit has the ears to hear you today, as well as the eyes to envision where you're going in the future.

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## StrataCom plan links frame relay, ATM

*continued from page 13*

When frames in an IPX-based frame relay network are destined for an ATM-switched network of BPXs, the interworking firmware on the IPX's ATM trunk module converts the frames into 53-byte cells and adds the appropriate formatting and control information.

Conversely, when ATM cells are destined for a frame relay network, an ATM user network interface (UNI) card in the BPX transforms those cells into variable length frames with the appropriate formatting and control information.

The ATM trunk module for the IPXs, which had been previously announced, will ship in the fourth quarter. The ATM UNI interface for the BPXs will ship in the second quarter of 1994, as will the interworking firmware.

Cisco, meanwhile, will add the interworking firmware to its routers. AT&T will use the firmware in StrataCom IPX switches that make up its InterSpan frame relay network and in the new BPXs the carrier will add to the InterSpan network.

Moley believes interoperability between frame relay and ATM networks will be vital to the success of ATM, and analysts agree.

"[StrataCom] owns the frame relay market as a switch vendor," Nolle said. "They'll take the BPX and deploy it as a switch to provide frame relay using ATM switching. Once the network grows, [users will] deploy more BPXs."

John Boyd, supervisor of communications systems at Northeast Utilities in Hartford, Conn., said interworking "validates" his company's decision to implement an IPX-based frame relay network four years ago. "We're beginning to see the fruits of our decision because we're not going through forklift upgrades," he said.

Pricing for a BPX functioning as an ATM trunk switch will start at less than $75,000. Pricing for a typical BPX service node with both ATM and frame relay functionality will be $250,000.

StrataCom did not provide pricing for the ATM trunk module or ATM UNI.

## Access gear lets users pick services

*continued from page 13*

cards can operate in dual-channel bank, drop-and-insert or cross-connect mode, and can perform T-1-to-E-1 conversion.

The server cards can route multiple channels of user voice and data traffic from multiple sources to different carrier services, depending on what devices are connected to the IMACS/800 to support a user's application.

Users can configure the IMACS/800 to route particular inputs into a specific server card. Users can also configure the server card to send packets over various wide-area links, depending on several factors.

Different server cards support Integrated Services Digital Network Primary Rate Interface, frame relay, Switched Multimegabit Data Services, voice compression and inverse multiplexing.

Pricing for the IMACS/800 starts at $10,000. The offering is available now.

# LOCAL NETWORKING

LAN HARDWARE, NETWORK OPERATING SYSTEMS AND LAN MANAGEMENT

## Worth Noting

"Our biggest challenge has been letting people know that Novell does Unix."

**Robert Davis**
Vice president and general manager
Novell, Inc.
San Jose, Calif.

## Netnotes

**FTP Software, Inc.** of North Andover, Mass., last week brought out PC/TCP for DOS and Windows Version 2.2, its workstation-based Transmission Control Protocol/Internet Protocol stack.

The product now includes an automatic installation program and a Windows front end that provides print redirection and management through Windows 3.1's file manager or through FTP Software's own network control panel. PC/TCP for DOS and Windows 2.2 will be available in mid-February for $400.

**Emulex Corp.**'s Network Systems Division last week introduced NetQue, a network printer sharing device that lets users on NetWare, Transmission Control Protocol/Internet Protocol, Digital Equipment Corp. Local Area Transport (LAT) and AppleTalk networks share Ethernet-attached printers or plotters.

The company also enhanced its existing NetJet interface board to support AppleTalk in addition to the other three environments.

NetQue attaches to a parallel or serial printer port and works at speeds up to 200K character/sec. Due out this month, the NetQue print servers vary in price according to the protocol supported.

NetWare IPX/SPX and AppleTalk versions list for $599 each, while TCP/IP costs $699, and DEC LAT is priced at $799.

## New version of LANalyzer leads NetWorld rollouts

### Others include MHS server, development tools.

By Caryn Gillooly
Senior Editor

BOSTON — Novell, Inc. last week brought out a new version of its LANalyzer network monitoring product that now includes an automated troubleshooting feature and support for token-ring LANs.

In addition to LANalyzer for Windows 2.0 — formerly called LANalyzer for NetWare — Novell used NetWorld 93 Boston here last week to release an upgrade to its NetWare Global MHS server and the availability of five new developer tools.

One of the primary features of LANalyzer for Windows 2.0 is what Novell calls the NetWare Expert, an intelligent troubleshooting system that automatically discovers and diagnoses more than 20 common network problems and offers users suggestions on how to fix them.

"The goal of this product is simple: Give all NetWare troubleshooters, regardless of their expertise, a tool that's easy to understand and use at a competitive price," said Navindra Jain, vice president and general manager of Novell's Network Management and Internetworking Products Division, based here.

According to Novell, the addition of NetWare Expert is designed to help make complex network analysis and management functions easier to understand and use.

For example, if an administrator double-clicks on a specific entry in the system's event log, NetWare Expert will list symptoms associated with that alarm and offer suggestions on how to correct the problem.

To further help the administrator, NetWare Expert includes an eight-hour computer-based training course on network analysis. According to Novell, NetWare Expert quizzes administrators on their knowledge of token ring and Ethernet, identifies their

*(continued on page 20)*

## Firm unveils variety of backup packs

By Joanne Cummings
Senior Writer

BOSTON — Mountain Network Solutions, Inc. last week announced new Novell, Inc. NetWare-compliant backup and storage management software at the NetWorld 93 Boston show here.

The firm also unveiled a two-tape data recovery system as well as a storage subsystem designed to provide high-speed data backup for portable, laptop and notebook computers.

The backup and storage management software consists of the JumpStart driver set and FileSafe plus Librarian (FSPL)/NLM, a NetWare Loadable Module (NLM) that provides backup management and recovery capabilities.

The JumpStart drivers comply with Novell's Storage Management Services, which ensures that the software will be compatible with future NetWare versions, said Daniel Stromska, vice president of advanced technologies at Mountain. In addition, the driver set makes Mountain's 4mm digital audio tape and 8mm helical scan tape drives compatible with NetWare's SBACKUP data backup utility; previously they required proprietary software.

FSPL/NLM is software designed to replace SBACKUP, offering increased functionality, including a catalog librarian that tracks data storage, enhanced media management, disk grooming, automated job scheduling and faster data retrieval. FSPL/NLM can also retrieve and manage data stored using SBACKUP and JumpStart, Stromska said.

The firm also announced Mountain Rescue, Windows-based software for recovering server or workstation hard drives.

Using FSPL and Mountain's Restore Any Day (RAD) media rotation software, users can automate the backup process to back up the entire drive weekly but perform daily differential, or changes-only, backups.

Mountain Rescue stores the

*(continued on page 21)*

### Help arrives on the LAN management front

| Vendor | Product | Description | Price | Availability |
|---|---|---|---|---|
| LANovation, Inc. | LAN Escort | Windows-based NetWare network manager | $995 for 50 users | Now |
| Teknosys, Inc. | HelpNetwork | Network-based Macintosh diagnostic tool | $749 for 10 users | Now |
| Apple Computer, Inc. | GrayShare | Network printer sharing for StyleWriter II printers | Free with printer | Now |
| CoOperative Printing Solutions, Inc. | COPSTalk for DOS | Provides access to AppleTalk services from DOS machines | $99 | Early first quarter |

NetWorld 93 Boston and MacWorld Expo/San Francisco both played host to the introduction of new LAN management and administration tools from various vendors.

SOURCE: *NETWORK WORLD*

## LAN Escort simplifies network mgmt. tasks

### Enables net administrators to manage multiple servers from one Windows-based workstation.

By Fredric Paul
Senior Editor

BOSTON — LANovation, Inc. used NetWorld 93 Boston here last week to announce a new version of its Windows-based Novell, Inc. NetWare LAN management tool that lets users manage multiple servers from a single Windows machine.

The announcement follows an array of Apple Computer, Inc.-related net management and administration products introduced the previous week at MacWorld Expo/San Francisco. Those products include a new printer management facility from Apple and Macintosh diagnostic software from Teknosys, Inc.

Minneapolis-based LANovation's LAN Escort consists of NetWare 3.11-resident server software and requires use of a Microsoft Windows 3.1-based client.

LAN Escort's Windows interface helps simplify many common network administration tasks, such as creating and modifying groups and users, controlling printers and setting network permissions for files and directories.

Administrators can create user privilege profiles that apply to entire groups of users or easily customize individual desktops choosing from a menu of options. An autorefresh capability is also built in that lets individual users default to a predefined desktop configuration in case of a failure.

Version 2.0 of the product adds support for multiple servers. After installing the product on each network server, the local-area network administrator can manage them all through one interface that displays a list of servers. In the original version of LAN Escort, administrators had to manage network resources by logging into each server one at a time.

With the new version, administrators can let users of any NetWare client machine print to any printer on the network or run any application on any server by clicking on the item in a list. Users don't have to worry about which server holds the particular application or wonder about the location of a printer.

> Users don't have to worry about which server holds a particular application.

Version 2.0 also lets network administrators print out reports of any list created in the program, such as user profiles by department. Previously, the product had no built-in print utility and users could only print data screen by screen.

LAN Escort Version 2.0 requires Novell NetWare 3.11 and Windows 3.1. It is available now and costs $995 for the 50-user

*(continued on page 20)*

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*Comparisons based on switched services of leading national carriers. **Data Communications Magazine User Survey—Private Line Services, August 1992.

## LAN Escort eases net mgmt. tasks

*continued from page 17*

version of NetWare 3.11 and $1,595 for the 100- and 250-user versions of NetWare 3.11.

**A shade of gray**

At MacWorld, Apple announced its new GrayShare technology, designed to help manage printing tasks across a network.

In addition to giving Apple StyleWriter II printers advanced gray-scale printing capabilities, the printer driver software also lets users share these printers over AppleTalk, TokenTalk and EtherTalk nets. Grayshare employs a simple graphical "Chooser," allowing Macintosh users to employ any StyleWriter II attached to any Macintosh on the network. Previously, printers had to be connected directly to the network.

Available now, the GrayShare software is included in the price of StyleWriter II printers.

Also at MacWorld, Teknosys unveiled the network version of its HelpNetwork Macintosh diagnostic software, which allows information systems personnel to remotely diagnose problems on any Macintosh on the network and supplies a server-resident knowledge base of possible solutions.

According to the Tampa, Fla., company, a new version due out later this year will also diagnose network-related problems, although the company could not yet provide further details. When it ships in April, HelpNetwork will be available in a number of configurations, beginning at $749 for a 10-user package. The company also sells subscriptions of updates to its knowledge base.

Teknosys unveiled the network version of its HelpNetwork Macintosh diagnostic software.

▲▲▲

MacWorld was also the site of CoOperative Printing Solutions, Inc.'s (COPS) introduction of its COPSTalk for DOS and upgrade to COPSTalk for Windows. The COPSTalk software gives DOS and Windows users, respectively, access to LocalTalk network servers.

COPSTalk for DOS, which works with DayStar Digital, Inc., Farallon Computing, Inc. and Apple LocalTalk cards as well as with most Ethernet cards, is due to ship in the first quarter for $99. COPSTalk for Windows 1.1 adds a file redirector and fixes a number of bugs. It will cost $179 when it becomes available in the first quarter.

COPS, headquartered in Norcross, Ga., also announced the completion of its acquisition of DayStar's line of networking products, including the LT-200 PC and MC LocalTalk boards as well as DayStar's networking software. COPS will assume development, enhancement, marketing, sales and support of the products, now renamed COPSTalk LT-I (using the Industry Standard Architecture bus) and COPSTalk LT-M (with the Micro Channel Architecture bus). ◘

## New LANalyzer leads rollouts

*continued from page 17*

strengths and trains them on their weaknesses.

The new version also lets users troubleshoot token-ring local-area networks in addition to Ethernet LANs, and lets them collect information on Transmission Control Protocol/Internet Protocol traffic.

The new AppleTalk and Internetwork Packet Exchange (IPX) router monitoring capabilities enable LANalyzer for Windows 2.0 to send a warning to the administrator if it detects a router failure.

**Messaging and more**

Novell's NetWare Global Messaging product is now called NetWare Global MHS and is available in a new version. The product is a scalable messaging server consisting of a set of NetWare Loadable Modules (NLM) that can support a variety of store-and-forward services, including electronic mail, work flow automation, and scheduling and fax services.

The new version includes FirstMail, a basic E-mail utility for DOS and Macintosh users. It also has new Passive Server capabilities, which let a single NetWare Global MHS server collect and route messages for mailboxes on as many as eight other servers.

Finally, new NetWare-enabled third-party development tools, such as NetWorks Developer, by Symbiotics, Inc., add support for the Windows Dynamic Data Exchange facility, while tools from Watcom will let developers write NLMs using C++ or Fortran.

Before this release, NLMs could only be written using C language.

The new tools are NetWorks Developer, priced at $2,495 and available now; STOP by Alpha Logic Technoloiges, Inc., priced at $49 and available now; Intek C++ 2.1 by Draiken Software, Inc., priced at $599 and available now; and Watcom's Watcom Fortran and Watcom C++, for which has neither pricing nor availability has yet been determined.

LANalyzer for Windows 2.0 will be available by the end of this month for $1,495, and NetWare Global MHS is available now for $249 for 20 mailboxes, $895 for 50 mailboxes, $1,495 for 100 mailboxes, $2,695 for 250 mailboxes and $7,495 for 1,000 mailboxes. ◘

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# AppleTalk router first to debut with AURP support

Third-party firms unveil products for the new router.

**By Fredric Paul**
Senior Editor

BOSTON — Apple Computer, Inc. last week rolled out a new version of its software-based AppleTalk router, while a number of third-party companies announced complementary products such as protocol extensions and network management tools.

The Apple Internet Router, which was expected ("Apple adds dial-up, WAN, TCP/IP support to router," *NW,* Jan. 11), is the first product to support the AppleTalk Update Routing Protocol (AURP), which is intended to improve performance and make it easier to route AppleTalk data over other types of networks.

AURP dramatically reduces network traffic by sending routing information through the network only when that information changes and by sending only the changes opposed to the entire routing tables. It replaces the AppleTalk Routing Table Maintenance Protocol used in the existing AppleTalk Internet Router 2.0, which transmits full routing tables every 10 seconds.

AURP was designed to make enterprisewide AppleTalk internets more efficient, manageable and scalable.

The protocol specifies a standard for tunneling AppleTalk through any type of net, including Transmission Control Protocol/Internet Protocol, X.25, Open Systems Interconnection and DECnet. It also enhances security with device and network number hiding, automatically remaps remote network numbers to resolve possible conflicts with existing numbers, allows for larger internets by manipulating hop-count records and improves use of alternate paths with hop-count weighting and backup paths.

Apple plans to promote AURP via standards groups such as the Internet Engineering Task Force and the AppleTalk Networking Forum, according to Craig Brenner, product manager for routing products. AURP is proprietary to Apple, but Brenner predicted other vendors will eventually support it to ensure interoperability with Apple products.

The Apple announcement also included a series of third-party products designed to work with the new router.

Cabletron Systems, Inc. of Rochester, N.H., announced its F6069 Desktop Network Interface card, which it says is the industry's first network adapter to support Fiber Distributed Data Interface routing to Macintosh users on LocalTalk, Ethernet, token-ring or FDDI networks. The new card uses AURP to improve access to 100M bit/sec FDDI nets for applications such as imaging, computer-aided design and manufacturing, video and multimedia.

MultiAccess Computing Corp. of Santa Barbara, Calif., announced that its $795 MCC-1000 SMDSTalk and $3,595 MCC-256 Switched 56K wide-area network adapter cards will work with the Apple Internet Router.

Neon Software, Inc. of Lafayette, Calif., announced that its LANsurveyor 1.0 and RouterCheck 2.0 products will support the new Apple router, as well. LANsurveyor, a $395 to $695 AppleTalk network mapping tool, will map AURP tunnels running through other nets, while the $895 RouterCheck is a management tool for AppleTalk routers.

The AG Group, Inc. of Walnut Creek, Calif., announced that its Silver Cloud hierarchical Macintosh Chooser and personal zone manager will work with the new router to simplify access to zones and services located across a large number of remote networks on a WAN.

The Apple Internet Router will be available next month. The core Basic Connectivity Package, which supports dial-up connections and is needed for all the extensions, will cost $499. The AppleTalk/IP Wide Area Extension, which connects AppleTalk local-area networks via wide-area TCP/IP-based links, will also ship next month for $499.

The AppleTalk/X.25 Wide Area Extension, which links AppleTalk LANs via packet-switched networks, will ship in March for $1,299. Upgrade programs will discount the Basic Connectivity Package to $149 for users who bought the previous AppleTalk Internet Router before Nov. 1, 1992, and to $49 for those who purchased the router after that date.

# Firm unveils backup packs

*continued from page 17*

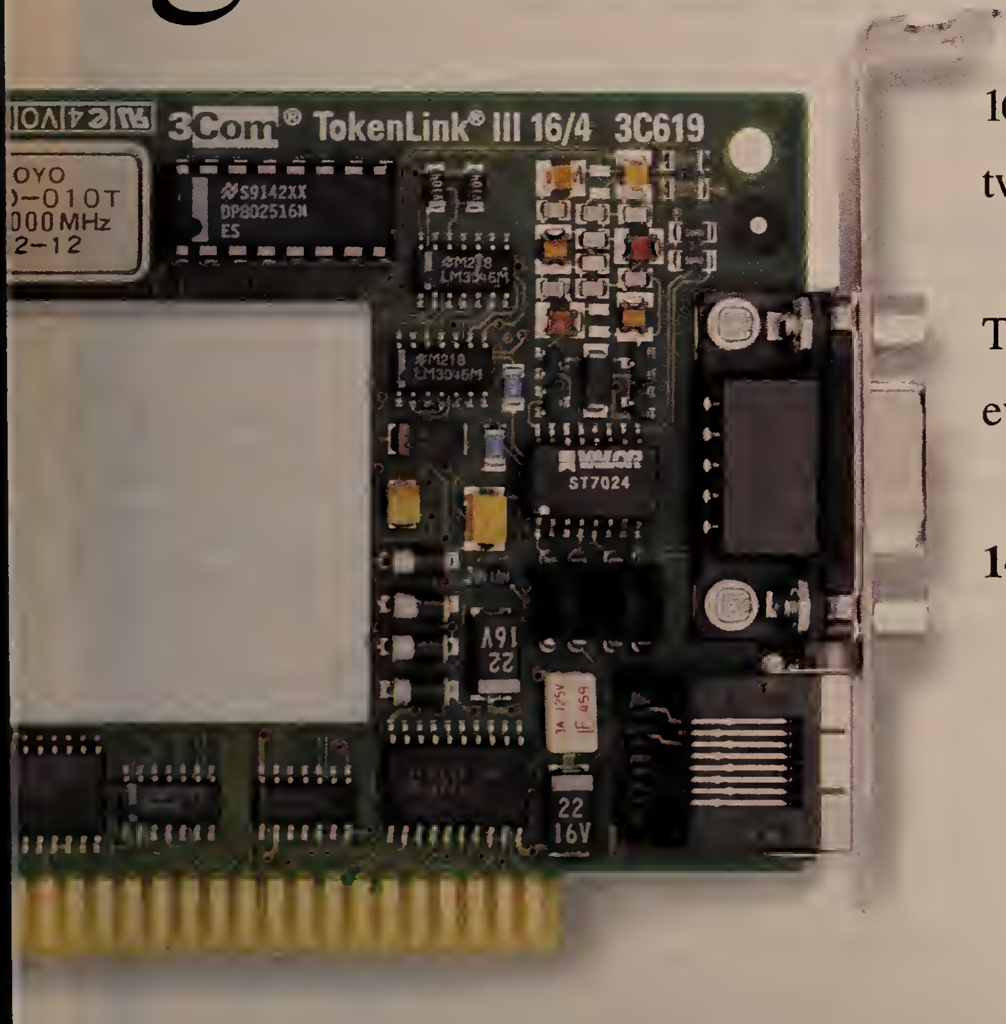
catalog librarian and RAD information for each backup on a floppy disk so that when hard drive information is lost, it can use the floppy disk to reboot the Mountain Rescue system. Mountain Rescue then tells the user the exact tapes needed for an entire hard drive or differential recovery — which is, at most, two tapes.

In addition, Mountain unveiled FileSafe SideCar, a tape backup system for portable computers that attaches through a computer's parallel port. It can store up to 305M bytes of data on a single DC2120 cartridge and has an integrated pass-through port that allows a printer and SideCar to share the same parallel port.

JumpStart drivers are available now and can be downloaded free of charge from Mountain's Bulletin Board System at (408) 438-2665.

FSPL/NLM will be available in 1993 for $1,595 per tape drive supported. SideCar is priced at $695 and available now. Pricing and a release date for Mountain Rescue were unavailable.

big and blue on the inside.



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# INTERNETWORKS

LAN-TO-LAN AND LAN-TO-WAN EQUIPMENT AND STRATEGIES

## Worth Noting

"You cannot put a router in the hands of the uninitiated because it's not an easy device to configure. If you don't really understand what you're doing, you're not going to get it to work, period."

**Tom Kadlac**
Vice president of
LAN design and engineering
Citicorp
New York

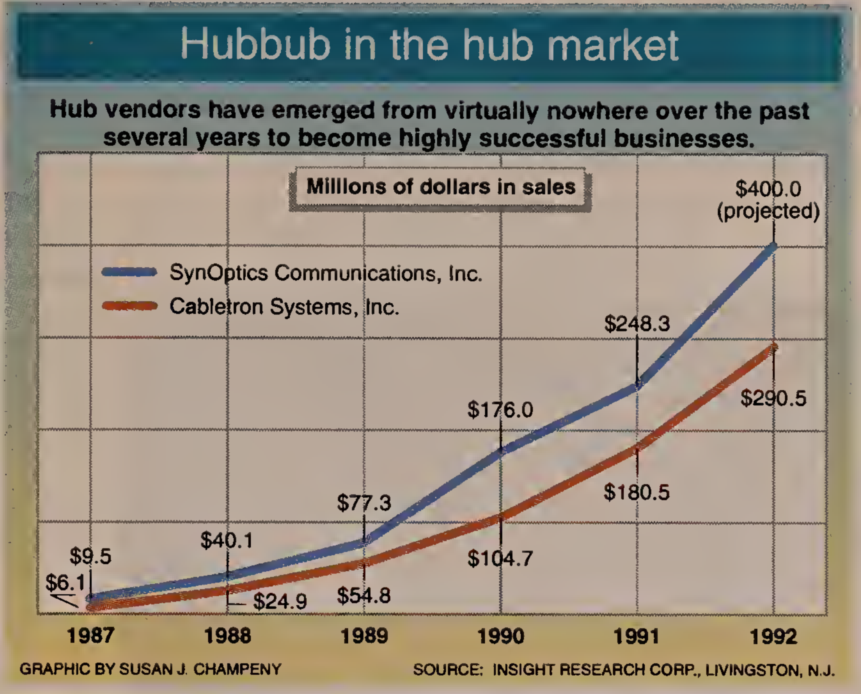
## Link Notes

**LANNET Data Communications, Inc.** last week rolled out a series of new token-ring modules for its line of MultiNet smart hubs. Three new token-ring station modules for both the 36-slot LET-36 and 10-slot LET-10 multiprotocol hubs were unveiled, including the 10-port LTR-104, which supports unshielded twisted-pair wiring, and the 10-port LTR-104/S, which supports both unshielded and shielded twisted-pair connections. The LTR-104/F is a four-port module that supports fiber-optic links.

All three modules, which support either 4M or 16M bit/sec and are hot-swappable, can also be configured as stand-alone multistation access units. As many as 18 twisted-pair modules can reside in the LET-36, providing 180 end-node connections. The 104, 104/S and 104/F are available now and cost $795, $895 and $1,395, respectively.

The company also introduced an active token-ring module for the MultiNet hub line. The LTR-T is a two-port repeater module that comes in

*(continued on page 24)*



Hubbub in the hub market

Hub vendors have emerged from virtually nowhere over the past several years to become highly successful businesses.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: INSIGHT RESEARCH CORP., LIVINGSTON, N.J.

# 3Com offers platforms for Boundary Routing system

### Unveils stand-alone version, modular form for hub.

By Skip MacAskill
Staff Writer

BOSTON — 3Com Corp. last week at NetWorld 93 Boston unveiled the hardware platforms for its recently announced Boundary Routing System Architecture — a stand-alone router and a version that can be integrated into the company's mid-range hub.

It also rolled out a new Ethernet multiprotocol router, dubbed NetBuilder Remote Access, which is designed for small to midsize remote offices and offers many of the features of the high-end NetBuilder II bridge/router.

The new Boundary Routing devices include the NetBuilder Remote Control router and the LinkBuilder Ethernet Connect System (ECS) Remote Control Module, both of which have one Ethernet interface and one wide-area network port.

Boundary Routing is a 3Com architecture introduced last month for remote office environments that have no more than 50 end nodes and are supported with a single WAN link.

Since there is only one path out of the remote office, the router does not require the intelligence of a conventional router, meaning unnecessary features can be stripped away to reduce cost and complexity.

NetBuilder Remote Control supports WAN links at speeds from 2,400 bit/sec to T-1 rates and offers users the choice of dial-up connections, serial lines or an external terminal adapter for Integrated Services Digital Networks.

"Performancewise, we're confident that it will completely flood any WAN link available," said Jeff Thermond, director of product marketing for 3Com.

NetBuilder Remote Control, which will be available later this quarter for $3,495, will also be offered in a token-ring version that is expected to ship by midyear. Pricing for that product was not available.

The modular version of the product, the LinkBuilder ECS Remote Control Module, fits in 3Com's LinkBuilder ECS line of work group concentrators. Compatible with both the four- and 10-slot ECS hubs, the module can be linked to a central NetBuilder II through one WAN port, offering the same functionality and features as the stand-alone version.

Available this quarter, the module costs $3,000. A token-ring version will be available by midyear.

**Future growth**

Remote offices outfitted with the stand-alone version of the router can grow with the size of the office by upgrading it to 3Com's new Remote Access router via a software upgrade.

The Remote Access router comes equipped with one Ethernet interface and a single WAN port that can be equipped with V.35, RS-232 or RS-449 inter-

*(continued on page 24)*

# Proteon introduces multislot router/hub

### BOSS device designed to ease the task of tying remote users into corporate internet backbones.

By Maureen Molloy
Senior Writer

BOSTON — Proteon, Inc. announced at last week's NetWorld 93 Boston an integrated router/hub aimed at easing the difficulty and cost of tying users in remote branch offices to a corporate internet backbone.

The ProNet BOSS (Branch Office SolutionS) is a three-slot device that combines Proteon's new Department Network Exchange (DNX) 300 bridge/router ("Proteon bridge/router eases remote site deployment," *NW*, July 27, 1992) with the vendor's Series 90 Intelligent Network Concentrator.

The new router/hub comes in two models. The first one is aimed at remote sites with an installed base of IBM Systems Network Architecture devices and can support as many as 20 token-ring nodes. The integrated DNX router comes equipped with two wide-area ports that support dedicated lines from 9.6K bit/sec up to T-1, as well as X.25 and frame relay.

The device will support the Transmission Control Protocol/Internet Protocol, Novell, Inc.'s Internetwork Packet Exchange (IPX) and source route bridging as well as the vendor's Synchronous Data Link Control Relay capability for transporting IBM 3270 traffic across an internet backbone.

The other model, aimed at remote local-area networks and workstations, can support as many as 20 10Base-T connections and the same routing capabilities. It will further support TCP/IP, IPX and Spanning Tree Bridging.

*(continued on page 24)*

# *Firm ups wide-area router capacity with compression*

By Maureen Molloy
Senior Writer

BOSTON — Netronix, Inc. announced at NetWorld 93 Boston last week a data compression interface for its TokenMaster 5000 bridge/routers that will enable the devices to support data compression at T-1 speed on as many as four T-1 links.

The new interface will enable the router to transmit more than 3M bit/sec of data on each T-1 link — or two times each line's capacity. Previously, the vendor's TokenMaster 4000 bridge/router offered data compression up to T-1 speeds of 1.5M bit/sec and only on one wide-area link.

This high-speed data compression will allow users to boost performance without adding wide-area lines and associated interfaces. Without compression, data-intensive applications such as file and image transfers could clog wide-area links, degrading performance.

Magnalink Communications, a division of Telco Systems, Inc., this month also unveiled a remote bridge that supports data compression, delivering a sustained throughput of 6M bit/sec over two T-1 links ("Compression bridge sets new pace for field," *NW*, Dec. 28/Jan. 4).

The new Netronix interface is based on Stac Technology, Inc.'s new 9706 compression chip and results in a data compression ratio as high as 4-to-1, depending on the data type. At a 4-to-1 ratio, a 56K bit/sec line can pump through as much data as a 224K bit/sec line.

According to Vic Forgetta, Netronix's director of marketing, the bridge/router vendor served as a beta site for the new Stac chip and will be the first company to incorporate it into a product.

The new compression card costs $5,990 and will be available for the company's TokenMaster 5000 bridge/router beginning this month.

For additional information, contact Netronix at (707) 769-3300.

## Link Notes

*continued from page 23*

both a shielded twisted-pair and an unshielded twisted-pair version and support either 4M or 16M bit/sec. Available now, the LTR-T costs $895.

**Ungermann-Bass, Inc.** last week at NetWorld 93 Boston introduced a new Ethernet Supervisor module for its Access/One Enterprise Hub that features flash erasable programmable read-only memory and support for the Trivial File Transfer Protocol and BootP industry protocols that download software and reconfigure devices remotely.

The new module, which can be used to monitor and control all token-ring, Ethernet and Fiber Distributed Data Interface modules in the Access/One, will be available in March and cost $3,950.

UB also announced Version 16.7 of its NetDirector network management system. The new features include remote downloading and configuration management, and additional hardware support for new UB products.

Available now, NetDirector 16.7 ranges in price from $8,000 to $19,500, depending on the number of nodes supported.

**Network Communications Corp. (NCC)** announced at NetWorld 93 Boston last week a WAN testing device that lets users monitor traffic patterns on the wide-area network side of its internet interfaces.

The InterNetwork Probe is a personal computer-based card that can be used as a WAN protocol and WAN interface analyzer. But it can also be used in conjunction with Novell, Inc.'s LANalyzer to provide simultaneous monitoring of the user's WAN and local-area network.

Once collected, the data can be decoded and displayed by the WAN diagnostic facilities built into the InterNetwork Probe and by the trace display facility of the LANalyzer. This provides a picture of events occurring on the LAN at the same time events are being monitored and trapped across the bridge or router on the WAN.

The InterNetwork Probe costs $4,395 and is available now.

For more information, contact NCC at (612) 844-0584. ◘

## 3Com offers platforms for system

*continued from page 23*

faces supporting the Point-to-Point Protocol, X.25, frame relay or Switched Multimegabit Data Service at speeds up to the T-1/E-1 rate.

Bridging protocols supported include the Spanning Tree Algorithm, transparent bridging and translation bridging. A variety of routing protocols are also supported, such as the Router Information Protocol and the Open Shortest Path First protocol.

Remote Access features a forwarding rate of 10,000 packet/sec, a filtering rate of 20,000 packet/sec and routing throughput of 9,000 packet/sec — all based on 64-byte packets.

Available by the end of the first quarter, Remote Access costs $4,995. It can be upgraded to a NetBuilder bridge/router via the purchase of a password license from 3Com. ◘

## Proteon introduces multislot router/hub

*continued from page 23*

Both models come equipped with redundant power supplies and hot swappable interface modules for added fault tolerance.

The DNX router module can support any combination of four protocols, including the same protocols and local- and wide-area network interfaces as Proteon's existing higher end 4100+ and CNX 500 bridge/routers. It is interoperable with the routers as well as the vendor's existing Series 70 and Series 90 intelligent hubs.

The BOSS is preconfigured and tested to ease installation, eliminating the need for specialized technicians at remote sites.

According to Proteon, the device comes equipped with a standard QuickStep Installation System, which is a menu-driven configuration program that enables nontechnical users to install and configure the router in less than 15 minutes. It automatically configures the router hardware for basic operation and features prompting scripts that let users customize the devices by protocols and interfaces.

Both the routing and hub portions of the BOSS can be managed from Proteon's OneView Simple Network Management Protocol-based network management system. The device can also be managed from IBM's NetView via Proteon's SNMP-to-NetView Gateway.

Both router/hub models cost $9,995 each and are available now. ◘

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# GLOBAL SERVICES

DOMESTIC AND INTERNATIONAL VOICE/DATA SERVICES, ACCESS EQUIPMENT AND REGULATORY ISSUES

## Worth Noting

> "When it comes to networking, it's not a question of public vs. private, it's an issue of how much you use of each."
>
> **Mark LaRow**
> Principal
> Ernst & Young
> Vienna, Va.

## Regulatory Update

**AT&T** last week denied charges filed by a user in New Jersey that allege AT&T caused his on-line real estate business to fail by flooding his 800 number with test calls.

Michael Valenti, owner of the now-defunct Real Estate Alternative (REA), filed a formal complaint at the Federal Communications Commission last fall seeking damages. He claimed that in October and November 1989, shortly after he launched the business, AT&T began sending test calls to his 800 number in such large quantities that he was largely unable to receive other business calls.

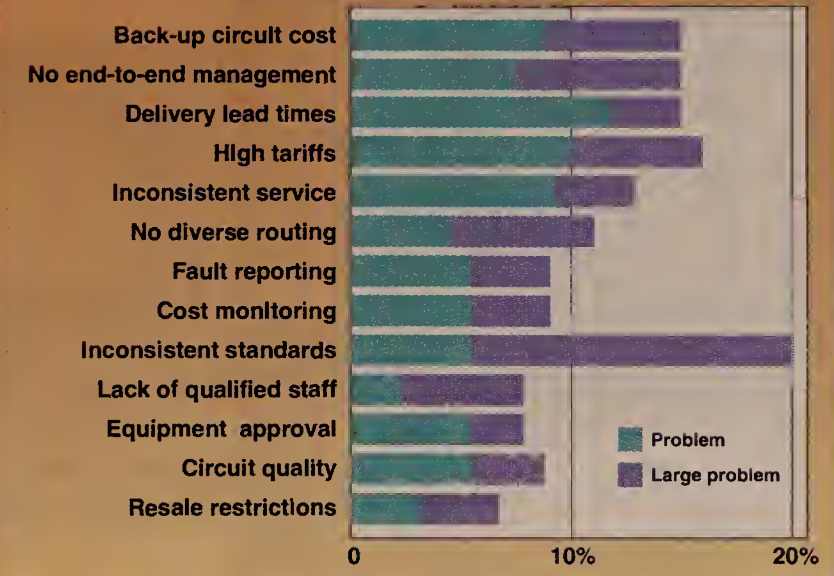
AT&T last week admitted that it placed some calls to Valenti's 800 number but disclaims any responsibility for his business failure. "REA's complaint on its face shows that the damages it suffered — if any — were the result of MCI, not AT&T," AT&T said.

Valenti did complain about the way MCI handled the investigation, but he claims that even after the origin of the calls was determined and a court in New Jersey ordered AT&T to stop calling, the carrier continued placing the calls. AT&T denies Valenti's allegations.

AT&T's other defenses are that Valenti took too long to file his complaint, that he did nothing to stem his losses and that he has not explained what provision of the Communications Act AT&T violated.

Global network nightmares

Percentages are based on a survey of 100 large, multinational corporations



GRAPHIC BY TERRI MITCHELL

SOURCE: THE YANKEE GROUP, BOSTON

# SW Bell set to move Tulsa to first citywide Centrex

## Will serve 3,000 extensions at 141 locations.

By Bob Wallace
Senior Editor

TULSA, Okla. — Southwestern Bell Telephone Co. last week said it has received a five-year, $3 million contract to build a citywide Centrex serving 3,000 extensions at 141 locations here.

Southwestern Bell said Tulsa will be the first city in its five-state region to use the citywide Centrex, which will be completed by the end of next month and will cover 2,000 square miles.

> "We have a lot of small offices, and citywide service lets us add these locations."
>
> ▲▲▲

The carrier said its Signaling System 7 network and advanced Northern Telecom, Inc. software form the underpinnings of its Plexar Centrex service, which enables all sites to use a single, uniform four-digit dialing plan.

"There are a lot of efficiencies for us to move to citywide Plexar," said Dale LeStourgeon, the city's telecommunications manager. "It's much more convenient for us to manage."

Large Centrex users with numerous sites in a metropolitan area have long sought citywide Centrexes and have used overlay networks to support such capabilities as uniform dialing plans.

The city of Tulsa has been a Plexar customer for several years, with a myriad of individual Centrexes. It decided to move to a single citywide system, which can be centrally managed from the Tulsa City Hall.

### Other features

In addition to the special dialing plan, the citywide Centrex also gives the city capabilities for service survivability, area-wide automatic call distribution, voice mail and customer-controlled moves, adds and changes.

Tulsa had 2,300 extensions on Plexar before it signed the latest contract, but the systems only served 85 locations. In many cases, sites had to dial seven digits — rather than four — to reach other city locations.

"We have a lot of small offices, and citywide service lets us easily add all these locations," LeStourgeon said. "With citywide Plexar, we can add them with a minimum amount of expense if our telecommunications needs grow in the next five years."

The city sites will be served by four primary and 13 secondary digital central office switches. Southwestern Bell linked all the city's switches with fiber-optic cable in 1991.

# FCC urged to revamp numbering system

## Agency noncommitted as pressure mounts to clean up overloaded telephone numbering system.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — Several user groups, state regulators and carriers have stepped up pressure on the FCC to come up with a plan to overhaul the nation's fragmented and overloaded telephone numbering system.

Last year, the Federal Communications Commission asked for industry suggestions on ways to improve the numbering system, but the agency has not committed itself to stepping in and taking on responsibility for numbering ("FCC asks users for dialing system input," *NW,* Nov. 9, 1992).

Several user groups, state regulators and carriers have now filed official requests asking the agency to take the next step and issue proposed rules.

Until now, Bell Communications Research, the research arm of the seven regional Bell holding companies, has administered the numbering system. Bellcore makes decisions on how to assign area codes, long-distance carrier codes and 800 numbers.

But now that the communications industry is more competitive with a host of new providers, including wireless carriers, many users and others say it makes no sense to leave Bellcore with a partisan stranglehold on administration of the nation's telephone numbering system.

### Far reaching

The way in which numbers are assigned has a huge impact on the way carriers and customers do business. For example, area codes are currently assigned on a geographic basis. But that strategy does not make sense for services such as cellular or personal communications networks, according to providers of such services.

If new wireless voice and data technologies are to take off, the numbering system must be reworked to support phone numbers that can travel with users, rather than being root-bound as numbers typically are today, some observers said.

With such portable numbers, users will have a wide array of options for local and long-distance voice and data services. They could also set up innovative calling features to support customers and employees.

For example, some users have begun to press for a single seven-digit number customers could dial from anywhere in the country. For this to happen, there would almost have to be a central

*(continued on page 34)*

# Rolm forms new network services unit

By Bob Wallace
Senior Editor

SANTA CLARA, Calif. — Rolm last week announced the formation of a network design and engineering group that will help optimize user networks and serve as a single point of contact for securing services and equipment on a global basis.

Rolm's new unit, the Network Systems and Services Group, will study and optimize existing user networks for cost and performance. Where needed, it will design new, more efficient networks using a mix of available technologies.

"Rolm has roughly 150 major accounts in the U.S.," said Wolf Rachlitz, director of the new unit. "These customers ask us how to make the best use of multiple networks. In many cases, that means consolidation."

The Network Systems and Services Group will study configurations of existing wide-area voice, data, integrated voice/data and video networks, as well as local-area network internets.

The Rolm unit will then design and implement networks that help users maximize network efficiency and optimize their investments in current products

*(continued on page 34)*

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# ENTERPRISE APPLICATIONS

CLIENT/SERVER AND ENABLING SOFTWARE: DISTRIBUTED DATABASE, MESSAGING, GROUPWARE AND IMAGING

## Worth Noting

"The market for scheduling and group calendaring has been simmering, and now it's at full boil."

**Ann Palermo**
Research director
International Data Corp.
Framingham, Mass.

## Store & Forward

Object-oriented database vendor **Objectivity, Inc.** of Menlo Park, Calif., last week announced Version 2.0 of its object database and development environment, Objectivity/DB, an offering that makes it easier for developers to build distributed object applications.

Available now, Version 2.0 lets developers create distributed object repositories. Developers can then share objects in these repositories when building distributed applications.

The new version also lets users move databases to different locations. It supports on-line, incremental backup and a query language based on SQL syntax.

**Fourth Wave Technologies, Inc.** of Troy, Mich., last week announced WinBEEP for Networks, Windows-based software that allows users to send text messages to alphanumeric pagers.

The software, which runs on any personal computer network, also lets users send messages to electronic mailboxes via Microsoft Corp.'s Messaging Application Programming Interface or the Vendor Independent Messaging interface.

The product costs $495 for the server software and a one-node license. An additional five-node license is priced at $495. ◘

# WordPerfect Office to get work group capabilities

### Offering mixes E-mail, calendaring, scheduling.

By Timothy O'Brien
West Coast Bureau Chief

BOSTON — WordPerfect Corp. used the NetWorld 93 Boston conference here last week to outline integrated work group capabilities that will be found in the new version of its WordPerfect Office multiplatform electronic messaging offering due out this spring.

By combining electronic mail, personal calendaring and group scheduling into a single application, WordPerfect said it will be able to add new features and functionality to WordPerfect Office Version 4.0, such as work flow, task management, hierarchical folders and rules-based message management.

"The synergy of combining E-mail, calendaring and scheduling into one is unique in the messaging industry," said Alan Ashton, president of WordPerfect. "Features normally found only in E-mail products have a new dimension in WordPerfect 4.0."

With this new version, WordPerfect is repositioning its existing work group office application into a more fully scalable, cross-platform, companywide open messaging platform that includes gateway links to most major corporate mail systems, the company said.

WordPerfect Office 4.0 will initially be released on DOS, Microsoft Corp.'s Windows and Apple Computer, Inc.'s Macintosh. Versions for OS/2, Unix and Digital Equipment Corp.'s VAX/VMS will follow.

To offer additional capabilities for the large base of DOS users, WordPerfect Office Version 4.0 features pull-down menus, mouse support and windowing capabilities.

Since many messaging features are being integrated into a single application, any combination of mail, scheduling and calendaring information can be viewed at one time. In addition, WordPerfect Office Version 4.0 has a single InBox that receives all incoming messages, such as mail, appointments, to-do items and notes.

WordPerfect has also incorpo-

*(continued on page 34)*

# *Futurus beefs up Team office productivity ware*

By Timothy O'Brien
West Coast Bureau Chief

BOSTON — With NetWorld 93 Boston as its backdrop, Futurus Corp. last week unveiled a series of enhancements for its Futurus Team groupware office productivity software, including support for wireless communications and added Windows features.

Futurus also announced it will be participating in Novell, Inc.'s newly formed Message Handling Service (MHS) Alliance, a consortium designed to foster interoperability among applications using Novell's MHS messaging environment.

Futurus has included MHS support in the Futurus Team product since 1988. Futurus President Robert Martinson said Futurus is committed to working with other developers to follow Novell's lead and promote MHS technology.

In order to provide users with the flexibility of wireless communications for laptop and notebook computers, Futurus announced support for the RAM Mobile Data nationwide wireless network.

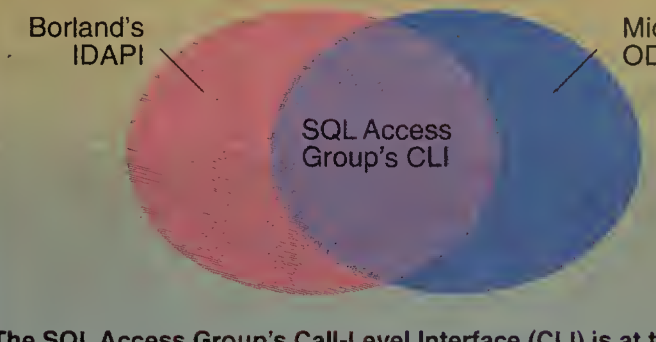
"Along with traditional phone lines, our customers will have a new choice for remote connectivity," Martinson said. He said the transition to wireless messaging should be "effortless because the Team interface for remote communications remains the same" and the connectivity mode — wired or wireless — is transparent to the user.

With this expanded wireless capability, users will have the ability to exchange electronic mail messages between most major metropolitan areas in the U.S. and U.K.

By taking advantage of RAM

*(continued on page 30)*

IDAPI and ODBC: seeking common ground



The SQL Access Group's Call-Level Interface (CLI) is at the core of both Borland International, Inc.'s Integrated Database Application Program Interface (IDAPI) and Microsoft Corp.'s Open Database Connectivity (ODBC) specifications.

GRAPHIC BY TERRI MITCHELL

# IDAPI adds mud to data access muddle

### Borland's API unsettles an industry that recently began jumping on Microsoft's ODBC bandwagon.

By Wayne Eckerson
Senior Editor

The good news about Borland International, Inc.'s Integrated Database Application Programming Interface (IDAPI) is that it could lead to a more robust industry standard for data access. The bad news is that it joins a long and confusing list of data access APIs.

IDAPI proponents say the API is meant to address requirements not currently supported by Microsoft Corp.'s Open Database Connectivity (ODBC), a specification developed by a coalition of 40 software vendors that is being widely implemented by independent software developers.

Unlike ODBC, which allows Windows applications to access SQL databases, IDAPI would also enable workstation clients to access non-SQL databases, such as Borland's Paradox and dBase as well as Novell, Inc.'s Btrieve.

"ODBC has some flaws," said Dwight Davis, director of engineering at Novell in Austin, Texas. "It was designed for a specific environment, Windows, which is fine except that we want a multiplatform, multivendor API that also supports navigational calls to desktop databases."

Borland's point person on IDAPI, Betsy Burton, said IDAPI and ODBC share a lot in common. Both are based on the SQL Access Group's (SAG) Call-Level Interface (CLI), and both offer unique extensions to it. ODBC's extensions are geared toward Windows applications, while IDAPI's extensions support navigational calls.

"This is not an API war; it's the natural evolution of APIs into mature standards," Burton said. "The industry should look at IDAPI and say, 'Great. This furthers the standards process. It unifies access to desktop and client/server databases.' "

But ODBC followers believe IDAPI is a political ploy launched by Borland primarily to create confusion among users and to thwart Microsoft. "This is pure politics," said Lowell Tuttman, senior product manager for ODBC at Microsoft. "It's really stupid. They have nothing to show but a four-page press release."

According to Tuttman, by the time Borland and others develop the specification for IDAPI and push it through standards bodies, ODBC will have been implemented on all client platforms. ODBC currently supports Windows and Apple Computer, Inc. Macintosh clients, and there are third parties working on Unix and OS/2 ODBC implementations, he said.

Tuttman added that ODBC supports navigational calls in its scrollable cursor model.

But Burton said Borland, Novell, IBM and WordPerfect Corp. — the initial backers of IDAPI — in the next month or two will present a first draft of the specification to the dozen other vendors that have formally expressed support for IDAPI. The final specifi-

*(continued on page 30)*

## Futurus beefs up Team office ware

*continued from page 29*

Mobile Data's store-and-forward technology, these messages can be delivered to local-area network users or individuals with portable sets who occasionally tap into the RAM network to check for messages.

With its new release of Team Windows Version 2.1, Futurus has added enhancements such as improved wide-area networking performance, smart icons, a new drag-and-drop windowing feature and expanded facsimile viewing, printing and sending capabilities.

Futurus has also added in Version 2.1 a new on-line help feature that includes full search, jump and pop-up capabilities. Existing Futurus Team users may upgrade to Version 2.1 at no charge by calling Futurus technical support in Atlanta.

Futurus' flagship product, Futurus Team DOS/Windows Combo, is a groupware productivity offering that includes E-mail, personal and group scheduling, as well as phone messaging and real-time chat. ◘

## IDAPI adds mud to data access muddle

*continued from page 29*

cation will be ready by midyear, she said.

IDAPI has strong backers because it promises to provide access to heterogeneous data across multiple platforms, said Stephen Carter, a product development manager for WordPerfect. WordPerfect, for example, has much invested in DOS and OS/2 applications and needs navigational calls to access desktop databases.

"ODBC does not run on all platforms we need to be on, and we didn't want to wait around for Microsoft to get ODBC there," Carter said.

But David McGoveran, president of Alternative Technologies, a market research firm in Boulder Creek, Calif., was skeptical that Borland could develop a workable specification for IDAPI.

"I've watched a lot of companies fail in their efforts to develop an efficient and syntactically correct interface to both relational and nonrelational systems," McGoveran said.

Such interfaces require applications to discern whether they are accessing relational or nonrelational data and contain code to make navigational calls, putting undue burden on both the application and database, said John Senor, vice president of the Enterprise Data Access/SQL division at Information Builders, Inc. (IBI) in New York. IBI makes a proprietary API for accessing relational and nonrelational data stores.

| Third-party vendors supporting IDAPI |
|---|
| Banyan Systems, Inc. |
| Borland International, Inc. |
| Cognos Corp. |
| Computer Associates International, Inc. |
| Crystal Services |
| Delrina Technology, Inc. |
| Frame Technology Corp. |
| Gupta Corp. |
| IBM |
| Intersolv, Inc. |
| Micro Decisionware |
| Micro Focus, Inc. |
| Microrim, Inc. |
| Novell, Inc. |
| Oracle Corp. |
| Pioneer Software, Inc. |
| SAS Institute, Inc. |
| Software AG of North America, Inc. |
| WATCOM |
| WordPerfect Corp. |
| XDB Systems, Inc. |

"IDAPI reintroduces the need to code database navigational calls into an application, and that's something you shouldn't have to do with an API," Senor said.

Despite the criticism, both sides admit there is room to resolve their differences. Most view SAG as the forum that will close the gap between the two groups. Microsoft's Tuttman said SAG may begin addressing the IDAPI vs. ODBC issue at its meeting next week in San Diego.

SAG chairman, Jeffrey Balboni, a consulting engineer at Digital Equipment Corp., said he has urged both groups to bring their specifications to SAG, sit down and resolve their differences. "And I believe they'll do that," he added.

Balboni also said he would like to see IDAPI and ODBC fade away as individual specifications and come fully under the SAG CLI umbrella. The core of each specification would be consistent with the SAG CLI, and any unique requirements, such as IDAPI's navigational calls or Windows extensions to ODBC, would be published as appendixes to the SAG CLI.

If IDAPI and ODBC are viewed as two intersecting circles, the overlapping part, which represents SAG CLI, will continue to expand (see graphic, page 29), Balboni said. "SAG's CLI eventually should become the standard call-level interface for all platforms," he said. ◘

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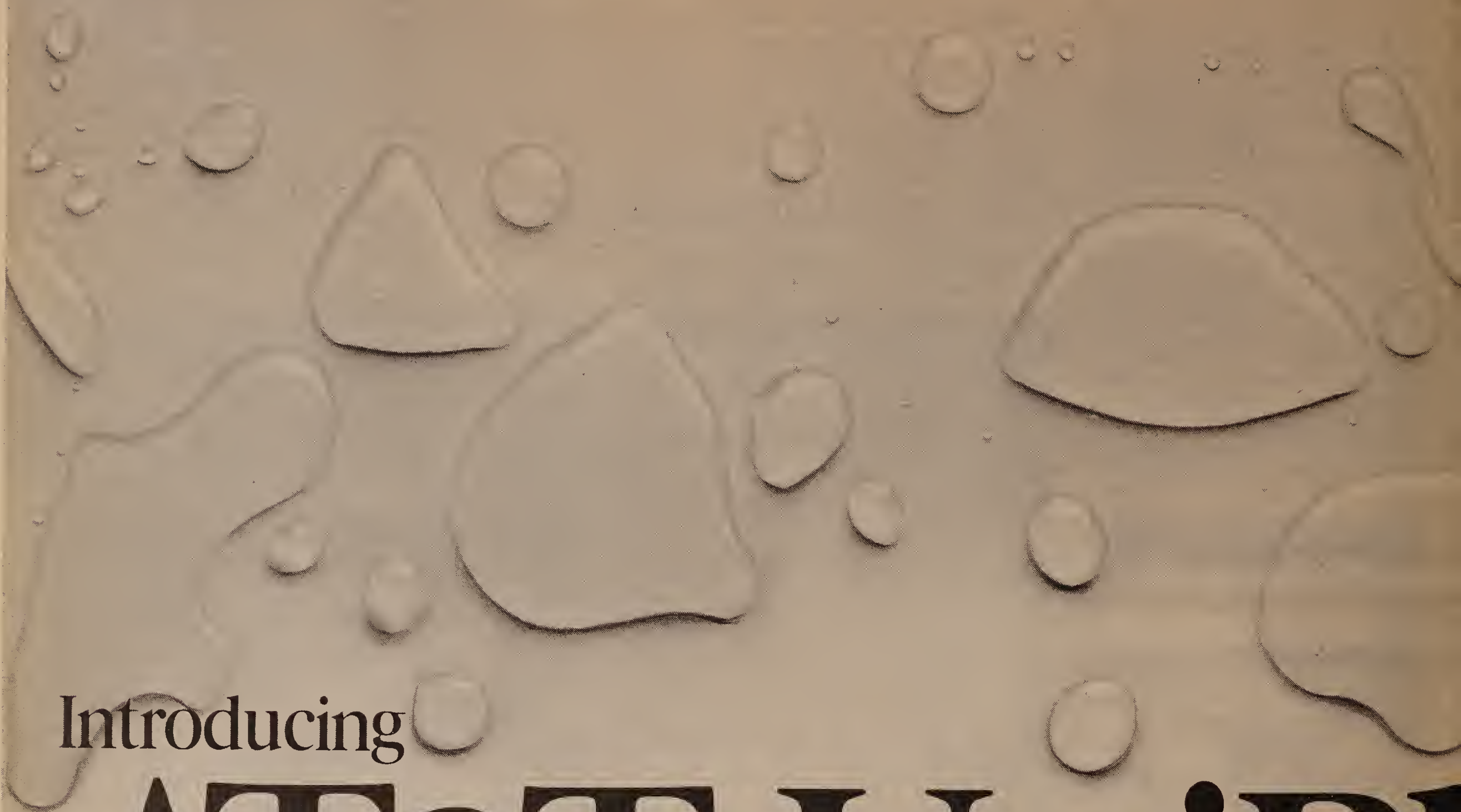

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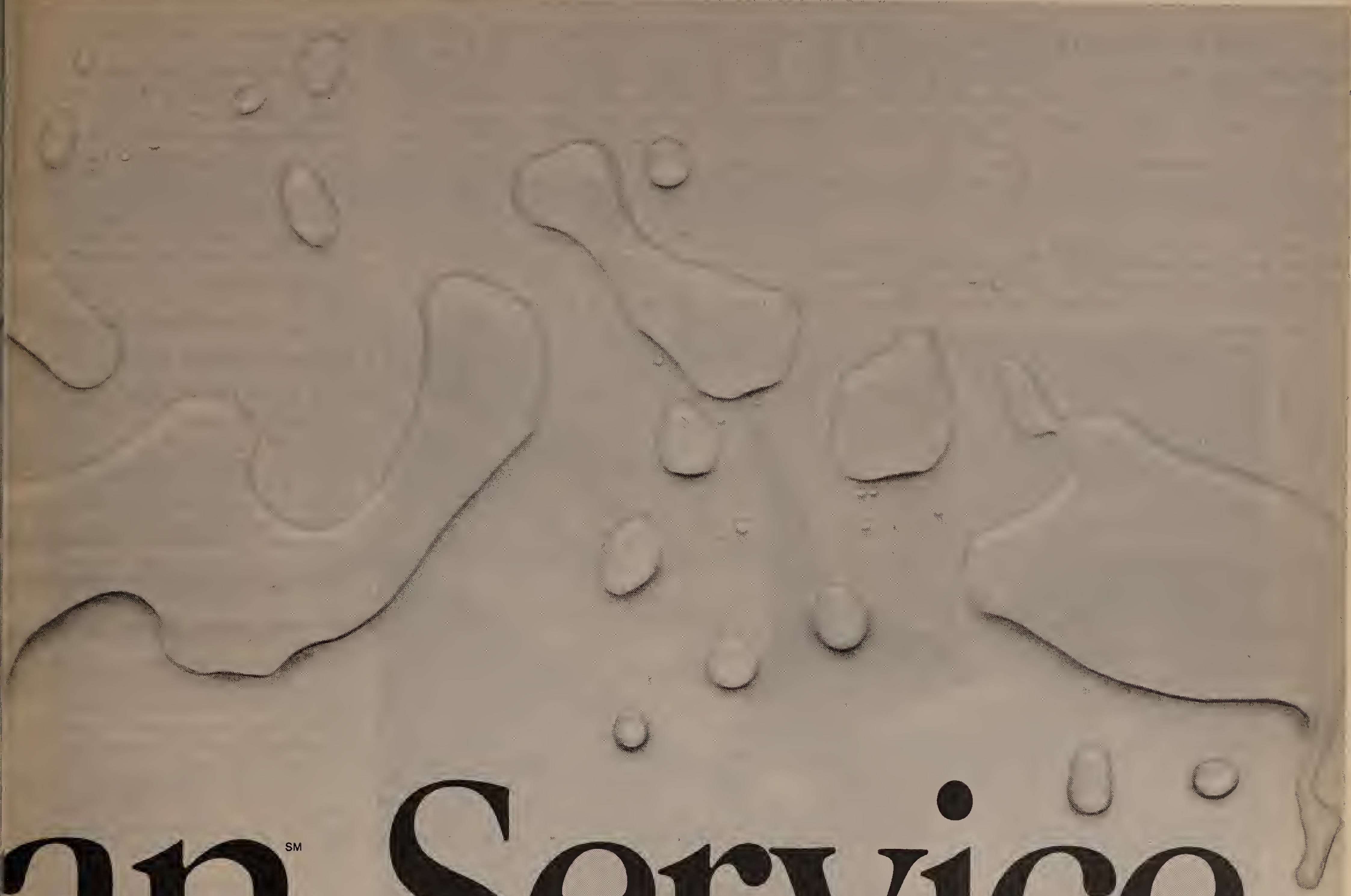

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**AT&T**

# FCC urged to revamp numbering system

*continued from page 25*

coordinator of phone number assignments.

With numbering emerging as a new area of concern to users, many think the FCC should be the new, neutral administrator of the system.

The Ad Hoc Telecommunications Users Committee questioned whether BellCore always considers the best interests of users. "In making administrative and other decisions regarding [numbering], BellCore and the LECs rarely, if ever, consider the costs and impacts of their actions on any other users," the committee stated.

The Ad Hoc Committee cited examples of carriers withholding premium telephone numbers — those with an easily recognizable pattern or numbers that spell out words — either for their own use or for higher rates.

The user group also expressed concerns that local carriers are either unable or unwilling to coordinate their efforts to develop a uniform dialing plan for users. For instance, if a user wanted a seven-digit number that could be called by customers across the U.S., local carriers throughout the nation would have to cooperate and set aside certain blocks of numbers. To date, that has happened on only a few occasions, primarily for directory service and nationwide test numbers, the group said.

State regulators in New York and Illinois also asked the FCC to step in and formulate a coordinated plan as well as appoint a neutral administrator to oversee the system. New York regulators said they are concerned that there be a fair way of assigning numbers to providers of new services.

"Our experience in New York has revealed some antagonism between the [RBHCs] and other service providers concerning the assignment of telephone numbers," the New York regulators told the FCC.

There is no set deadline by which the FCC must act on the user requests. The agency could either ask for additional information from the industry or propose a new numbering plan based on the current input. ☑

# Rolm forms new net services unit

*continued from page 25*

and services.

Also, the organization will constantly assess emerging technologies that carriers use to deliver metropolitan-area, national and international network services.

Rolm says that in the U.S., it will use its experience as a top private branch exchange manufacturer and knowledge of the U.S. network services market to help users make better use of their domestic networks.

And since it is part of Siemens AG, Rolm will be able to leverage its parent company's close ties with foreign telecommunications administrations and streamline the process of ordering, provisioning and managing network services.

Rolm will also be kept well informed on emerging services, such as Switched Multimegabit Data Service, and other offerings based on its parent company's network switches.

Rolm's Network Systems and Services Group is an outgrowth of Siemens' two-year-old International Corporate Networks business in Europe. That unit has built global nets for Ford Motor Co. and Mercedes-Benz AG. ☑

# WordPerfect Office to get capabilities

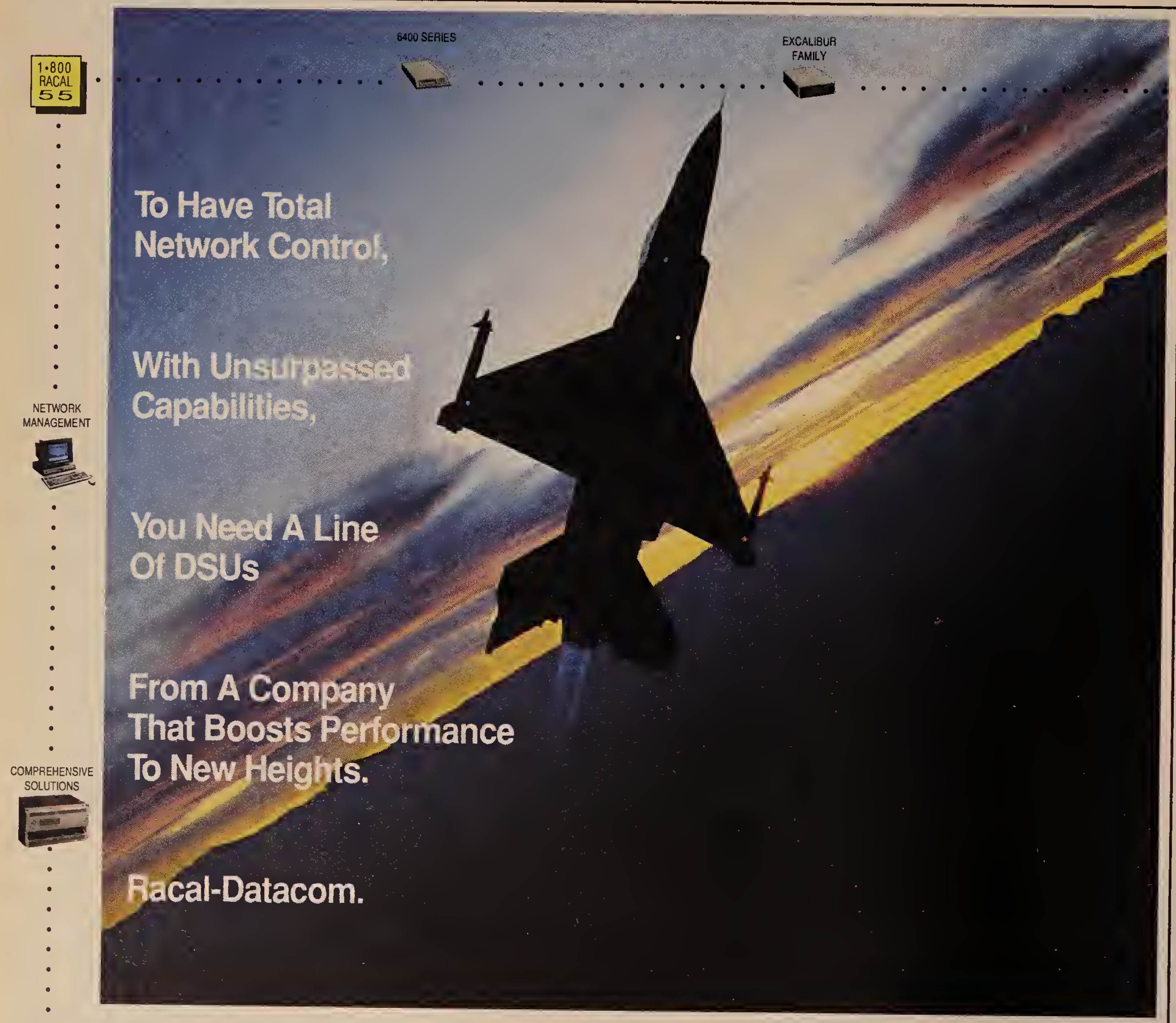
*continued from page 29*

rated in the new version components of its recently announced electronic forms program, WordPerfect InForms, in order to add work flow and data access capabilities.

With InForms, users can design forms that can be distributed through WordPerfect Office for the gathering and updating of information in a task. In addition, users can write reports directly to major databases such as Sybase, Inc.'s SQL Server, Oracle Corp.'s Oracle Server and Borland International, Inc.'s dBase.

Version 4.0 will also allow users to create any number of folders with multiple levels of subfolders. These folders can contain different types of information including mail, appointments and other task- or project-related instructions.

WordPerfect Office 4.0 will include advanced rules that allow users to predefine an action or any number of actions on incoming messages. These rules can be triggered by a word or combination of words on a high- or low-priority basis. Some predefined rules will be bundled with 4.0 when it is available. Pricing for the new version has net been announced. ☑



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# INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS, ALLIANCES AND FINANCIALS

## Worth Noting

Sales of network management products and services will quadruple from $3.9 billion in 1992 to $15.8 billion by 1998, growing at more than a 25% compound annual rate, according to a new study from Market Intelligence Research Co., a Mountain View, Calif., market research firm.

## People & Positions

**Ilene Lang** last week was named vice president of international product planning and development at **Lotus Development Corp.**, a Cambridge, Mass., software vendor. Lang will be responsible for the approval and development of Lotus products sold outside of North America. Previously, she was interim chief operating officer of the Industrial Technology Institute, a contract research and development organization.

Lang replaces Larry Crume, who served as vice president of international product planning and development on an interum basis while holding down the post of vice president of Lotus' mobile computing group, a position he is retaining.

**Unisys Corp.**, a Blue Bell, Pa., computer and network products vendor, has named **Craig Mento** as vice president of the company's newly formed Communications Systems Division. He will be responsible for overall operations of the new division, including sales, professsional services and application de-

*(continued on page 36)*

### Sizing up worldwide telecom investments

| Country | ISDN deployment (Percentage of central offices offering ISDN) | | Total network capital investment (As percentage of carrier revenue) | |
|---|---|---|---|---|
| | 1991 | 1994* | 1991 | 1987-91 |
| France | 100% | 100% | 33% | 28.6% |
| Germany | 60% | 100% | 42.9% | 40.5% |
| Japan | 82% | 100% | 38.6% | 39.7% |
| Singapore | 100% | 100% | 29.7% | 17.4% |
| U.K. | 60% | 100% | 18.5% | 24.3% |
| U.S. | 19.6% | 50% | 18.9% | 19.8% |

*Estimated

GRAPHIC BY TERRI MITCHELL

SOURCE: CENTER FOR TELECOMMUNICATIONS MANAGEMENT RESEARCH, UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES

# Study of telecom services shows U.S. falling behind

Report finds U.S. lags in some technologies.

**By Ellen Messmer**
Senior Correspondent

LOS ANGELES — A public network study released by the University of Southern California (USC) paints a picture of the U.S. as an uneven patchwork of networks growing increasingly obsolete in comparison to those in Europe and the Far East.

USC's "Telecommunications Infrastructure Policy and Performance" study examines network services in 18 countries and shows the U.S. lagging behind many other nations in network digitization, deployment of Integrated Services Digital Network and the rate of capital investment in the public network.

The report raises questions about whether the U.S.'s traditional reliance on free market forces can foster network modernization as well as the focused government policy initiatives evident in other countries. Arguing that availability of advanced communications services contributes to a nation's global competitiveness by attracting business, the report does not offer much new good news about the U.S.

"In terms of digitization, other countries are ahead of us," said Edward St. Croix, director of business development at Northern Telecom, Inc., who authored the report along with USC Professor William Davidson and Mesa Research, Inc. analyst Ronald Hubert.

St. Croix, on assignment from Northern Telecom, spent a year at the university's Center for Telecommunications Management compiling the research data.

According to the report sponsored by AT&T, Sprint Corp., Northern Telecom, Arthur Andersen & Co. and the regional Bell holding companies, the digitization of the U.S. public network stood at just over 50% at the end of 1991 — putting the U.S. 9th out of the 18 countries reporting.

St. Croix

The U.S. also had a low level of Integrated Services Digital Network deployment in comparison to France, Japan, Hong Kong and Singapore (see chart, this page). For investment in the public network, the U.S. came in 10th among the 15 nations that supplied figures.

The USC study contained no analysis of pricing, but St. Croix asserted that network modernization works to lower prices as more and more users sign on for new, ubiquitously available services.

Len Elfenbein, consultant in international telecommunications at Lynx Technologies, Inc., said the study's figures were not surprising to him, based on his own observations about services in other countries. He also pointed out that rapid deployment of new services does not inevitably

*(continued on page 36)*

# Users drumming up support for X.435

Petroleum industry to hold EDI conference in March in an effort to gain vendor product support.

**By Bob Brown**
Senior Editor

HOUSTON — Users in the petroleum industry this week will begin calling on EDI software and service vendors to participate in what could be the first major event geared toward getting the X.435 market rolling.

The special X.435 meeting is being organized by the American Petroleum Institute (API), the petroleum industry's Washington, D.C.-based trade association, and will take place here on March 29. It is being held the day before the Petroleum Industry Data Exchange (PIDX) Spring User Group Meeting. PIDX is the API's electronic data interchange standards committee.

The X.435 meeting will serve as a forum for vendors to discuss their product plans with large users, which are hoping that convening the event will pressure vendors to step up support for X.435. To date, few products have surfaced that comply with the X.435 CCITT standard for transmitting EDI messages over X.400 networks.

"There's been a reluctance among vendors to move toward X.435, but users are eager to find out what's going on with their product plans," said Betty Zimmerman, a PIDX member and a technologist responsible for EDI product and service acquisition in Texaco, Inc.'s Information Technology Department.

PIDX issued a statement of direction in September outlining the petroleum industry's support for X.400 and X.435.

X.435 will let users meld their electronic mail and EDI messages onto a single network for better efficiency. It also boasts improved security features.

The API will be sending out letters to a host of vendors that have either rolled out X.435 products and services or plan to do so. Vendors being targeted include AT&T, GE Information Services (GEIS), Isocor, MCI Communications Corp., Soft-Switch, Inc., Supply Tech, Inc. and Texas Instruments, Inc., among others.

*(continued on page 36)*

## INDUSTRY BRIEFS

**IBM in the Chase.** The Chase Manhattan Bank, N.A. last week signed a systems integration agreement with Integrated Systems Solutions Corp. (ISSC), a subsidiary of IBM. ISSC will consolidate Chase regional banks' existing computer systems in New York, Maryland and Connecticut into a single computer network linking the 350 branches through a data center in New York.

The banking institution will adopt the IBM Personal System/2 local-area network-based Branch Automation Application software as well as IBM's banking software for large financial institutions.

Last week, ISSC also concluded an outsourcing agreement with Kaiser Permanente for operation and support of information processing and videoconferencing for the firm.

**Modem vendors reach settlement.** Modem manufacturer Multi-Tech Systems, Inc. announced it has reached a settlement with Hayes Microcomputer Products, Inc. over litigation started in 1988 when Multi-Tech fought Hayes' demands for royalty payments based on Hayes' patent infringement claim. Multi-Tech paid an undisclosed sum to Hayes in the settlement but did not admit to patent infringement.

The settlement resolved the dispute without requiring a court trial.

## Users drumming up support for X.435

*continued from page 35*

Madeline Sorrentino, product manager for X.400 and directory services at AT&T EasyLink Services in Lincroft, N.J., said user pressure drove vendors to X.400 interconnection, noting that the approach makes sense for X.435, too. Vendors need to make a business case for investing in X.435, and a strong show of user support is convincing, she said.

A study commissioned by AT&T EasyLink Services concluded that 1993 will see a rollout of X.435 products from most service providers and software vendors, Sorrentino said. AT&T plans to unveil a service by year end and would be open to participating in the PIDX meeting.

Representatives from both GEIS and Supply Tech said their companies are working to support X.435 and would like to get involved in the X.435 event.

Clay Youngblood, EDI product manager at TI in Plano, Texas, said he is hopeful that bringing vendors and users together here "will get a ground swell of support started from both parties." TI is getting ready to participate in an X.435 gateway pilot with MCI and is also developing X.435 capabilities for an internally developed EDI gateway to be used by TI and sold externally.

Youngblood warned that if some products or services start rolling out, there will still be a good deal left to do in order to make X.435 work. For example, even after X.435 services are available, applications designed to handle X.435 will be needed.

For more information on the X.435 meeting, call John Oshinski, the API's EDI coordinator, at (202) 682-8491. ◻

## People & Positions

*continued from page 35*

velopment of Unisys offerings to the U.S. telecommunications industry.

Previously, Mento was vice president of marketing operations in Unisys' Airlines and Communications Systems Division.

**James McCormack**, a founder of software vendor McCormack & Dodge Corp. and chairman of that company prior to its sale to The Dun & Bradstreet Corp., has been named vice chairman at **US LAN Systems Corp.**, a Vienna, Va., vendor of client/server-based accounting software. **Maurice Giguere**, another former McCormack & Dodge executive, has been named US LAN Systems' vice president of marketing.

**Hughes LAN Systems, Inc.** has appointed **Arlin Torbett**, formerly an independent consultant specializing in developing engineering and marketing plans for local-area network and data communications companies, as vice president of engineering. Torbett will direct all Hughes LAN Systems' product design and development activities, including high-bandwidth hub connectivity products. ◻

## Study shows U.S. lagging in telecom

*continued from page 35*

work to the benefit of users. Foreign monopoly carriers, which can decide to quickly roll out a new service within a country, frequently force users to migrate to the new service by pricing older ones too high.

"Rapid deployment of new services can limit users' options and choices," he said. "There is an absence of development of competing services and the captured market has to pay the dictated prices."

In the long run, the free market provides users with better prices and a wider range of choices, he said. "I don't agree that overseas services are better than [those available] here," Elfenbein concluded.

As the USC report was sponsored in large part by the regulating carriers, it is not suprising that they placed some of the blame on the U.S. regulatory arena — where federal and state policies often conflict — for the relatively poor U.S. showing. It said the Bell companies, which write off their equipment according to the state depreciation rates, keep their digital switches for an average of 19.55 "asset life" years; however, the long-distance carriers, governed by federal rates, reported an average 9.23 years of "asset life" for the same equipment.

This stands in contrast to Japan, where a single government authority allows for writing off digital switches there in six years, St. Croix said. "With a single government model, you're able to create a policy for a single objective," he said.

"Longer asset lives reduce current operating expenses, but slower capital recovery does not bode well for network modernization," the USC report concluded. "Long asset lives work against aggressive deployment of new technologies and the creation of a modern communications infrastructure." ◻

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# MANAGEMENT STRATEGIES

ENTERPRISE NETWORK STRATEGIES, USER GROUPS AND MANAGING PEOPLE AND TECHNOLOGY

## Worth Noting

"The ATM vendors are like [evangelists]. They say ATM will be the best thing that has ever happened, and they really don't see beyond that. I say, don't give me religion. I'm trying to solve my business problem today."

**Dave Leinweber**
Senior manager of the corporate network group
Microsoft Corp.
Redmond, Wash.

## Manager Minutes

The **University of California, Santa Cruz** is offering several courses designed to update technical professionals on multimedia technology. The courses include "Fundamentals of Video Technology" on Jan. 30 and 31; "Doing Business in the Emerging Multimedia Industry" on Jan. 30; and "Multimedia Software Design: A Hands-on Workshop" on Feb. 10-11. For more information, call the school at (408) 748-7375.

The **International Association of Hewlett-Packard Computer Users (INTEREX)** will host the 1993 INTEREX Computing Management Symposium (ICMS) April 4-7 in Seattle. It is for managers of Hewlett-Packard Co. net environments and will feature over 50 sessions, panels and tutorials, as well as product demonstrations.

ICMS costs $575 for INTEREX members and $775 for nonmembers until March 12, when the registration rate will increase by $100 for both groups. For more information, call (800) 468-3739. ◻

### Techniques for successful TQM

**After studying 4 successful Total Quality Management programs, CSC Index uncovered 5 keys to profiting from the initiatives:**

**Firms studied:**
- The National Road Motorists' Association
- The Prudential Assurance Co.
- AT&T Bell Laboratories' Computing Technical Center
- Motorola, Inc.

**Keys to success:**
- Long-term, companywide commitment
- Effort driven from the top
  - Customer focus
  - Environment structured to encourage change
  - Good performance measurement and feedback system

SOURCE: CSC INDEX, CAMBRIDGE, MASS.

# Study finds TQM programs not meeting expectations

## Offers tips for successful plan implementation.

**By Joanne Cummings**
Senior Writer

CAMBRIDGE, Mass. — Although many IS organizations are implementing Total Quality Management (TQM) programs, few are enjoying the benefits they expected, a CSC Index study has found.

TQM programs come up short because companies fail to balance the long-term objective of improving quality throughout a corporation with short-term activities designed to demonstrate progress and deliver measurable benefits, according to Tony DiRomualdo, director of foundation research at CSC Index here.

Successful TQM programs improve productivity, cut costs and enhance job satisfaction by instituting a set of management principles and practices that focus on customer requirements and internal process improvement, the report said. By studying a handful of successful TQM programs, CSC Index uncovered key areas that users implementing TQM need to address.

The organizations studied were: The National Road Motorists' Association, an Australian company that provides auto insurance as well as breakdown services; The Prudential Assurance Co., a U.K.-based insurance carrier; AT&T Bell Laboratories' Computing Technology Center, the lab's customer service arm; and Motorola, Inc. Through TQM initiatives, these firms were able to reduce information systems costs by one-third to one-half, cut systems development time by as much as 30% and significantly

*(continued on page 44)*

## Network Help Desk

*Network World* needs your help. We're developing a new reader service called the Network Help Desk to give readers a sounding board for everything from technical problems to discrepancies with vendors.

To kick off the new feature, which will begin in the first quarter, we need you to prime the pump by submitting questions that we will have answered by vendors, leading network integrators, consultants, educators or researchers.

The Network Help Desk will address questions/comments concerning problems with suppliers we may help resolve, technical questions for experts we will seek out, or even basic things like how to contact federal communications agencies or how to determine the leading products used by particular industries.

You may submit questions to Susan Collins, associate features editor, by calling her at (800) 622-1108, messaging her via *Network World*'s bulletin board (see logon instructions, page 2), faxing questions to her at (508) 820-3467, or via the Internet at network@world.std.com. You may also contact Charles Bruno, features editor, at (800) 622-1108 or via any of the above methods. ◻

## MANAGING TECHNOLOGY

BY DAVID FERRIS

# Windows moves to network intelligence

All of the hubbub surrounding Microsoft Corp.'s recent announcement of Windows for Workgroups (WFW) leads one to examine the firm's networking track record, as well as where it may be headed.

In 1984, Microsoft Corp. produced its first networking extension to DOS, known as Microsoft Networks. A simple peer-to-peer operating system, the product failed because it was too memory-intensive. Products such as Artisoft, Inc.'s LANtastic (with its clever random-access memory cram workarounds) rushed in to fill the void.

Microsoft's next attempt was LAN Manager, introduced in the summer of 1988. It didn't win over the market because it required support for OS/2, and third-party products were few and far between.

In the end, going with Novell, Inc.'s NetWare or a much simpler network operating system (NOS) such as LANtastic was the easiest choice.

Meanwhile, Microsoft launched a new workstation operating system extension — Windows — in 1985. By 1989, it was making headway and application vendors had begun writing to it.

Windows' success led Microsoft to extend it with some basic net functionality. Windows Version 3.0, released in May 1990, was the first step. Through tools such as File Manager and Print Manager, it allowed users to browse and connect to remote directories and printers.

Version 3.0 was just the beginning, though. Many important details, such as logons and a custom menu system, were missing.

But when you consider Windows is just another operating system, this isn't surprising. It's a big project and will take at least 10 years to mature.

Although Microsoft is doing a confusing job of marketing WFW, the product is actually just the latest version of Windows designed to help small work groups network their personal computers.

With WFW, PCs can now share resources on a peer-to-peer basis. Other network enhancements are logon security, including logon account and password, and a multi-NOS capability in which users can concurrently access servers running different NOSes.

Dynamic Data Exchange also works over the WFW network, as does Object Linking and Embedding via a new program called the ClipBook Viewer.

WFW's installation is highly automated, and the software comes with adapter cards and cables, which is convenient for first-time networkers. Also, Microsoft's electronic mail and group scheduling packages are included.

In other words, WFW is Microsoft Networks all over again — except it's a lot better.

**Will WFW succeed?**

WFW will do well among work groups of up to about 15 users. Those users will be drawn to WFW for many of the same reasons they are drawn to LANtastic and Apple Computer, Inc.'s System 7 for the Macintosh — low price, no need for a dedicated server and simple installation and administration.

Larger work groups are less likely to be attracted, primarily because WFW lacks centralized user-password security. Many other administrative tools are also missing.

Where larger groups do use WFW, it will typically be because they have limited networking needs. ◻

*Ferris is president of Ferris Networks, a consultancy in San Francisco.*

# OPINIONS

## USER VIEW

BY DOUG WELCH

# Dreaming of global nets and intimate computing

In a recurring dream that I hope will someday come true, I have a computer that can easily be carried anywhere. It uses radio waves to connect to a global information network. When I'm eating lunch, a partner in Tokyo accesses this computer and grabs copies of shared files.

This computer remembers where all my data is stored, even if it is spread across several file servers at the office, on my home computer or other remote systems. When I want to know what announcements a particular company is making on a given day, this computer queries the proper databases and reports the results.

This system also learns how I work. I tend to read my electronic mail first thing in the morning, after lunch and once in the evening. This computer will take the liberty of gathering my mail from a variety of different sources and having it ready for me to read at my usual times.

When I wake up, I realize this system would allow me to live my professional and personal life with a level of freedom unknown today. Others agree.

Apple Computer, Inc. Fellow Alan Kay has called what I experience in my dream "intimate computing." A level of magnitude above the personal computing we experience today, intimate computing integrates computers into both the professional and personal sides of our lives. This type of computing requires a small, inexpensive, yet high-powered computer that is connected to a large-scale radio network that will allow it to access other systems and computers regardless of location.

Science fiction authors have talked about such a computer for years and even Apple's John Sculley spreads the concept of Knowledge Navigator wherever he goes. This intimate computing device includes a talking video agent that reminds you of appointments, manages your electronic communications, screens your calls and even takes messages.

Intimate computing will force companies to reevaluate the concept of interconnected local-area networks. Stand-alone LANs will go the way of the stand-alone PC. A global network will link intimate computing devices at all but the most secure sites and allow the network of computers and intelligent appliances at my house to connect to my office LAN. As a result, information could be stored where there is capacity and remain easily accessible. This global network will allow people to work from home, local offices or on the road with equal ease. New software will allow them to control huge amounts of data and personalize the information they receive based on their preferences.

Despite the gloom-and-doom speculations of some, I believe that such a global network of intimate computing devices would not shackle us to our work but free us from the tyranny of the telephone wires we have lived with for over 100 years. We could go about our business secure in the knowledge that if someone needs to reach us, they can. ◘

*Welch is a support analyst for a major entertainment corporation in Los Angeles.*

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**Laura Swanton**
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Hughes LAN Systems, Inc.
**Jane Videtich**
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Systems Development Manager, R.J. Reynolds Tobacco Co.
**Stanley Welland**
Manager, Corporate Telecommunications
General Electric Co.
**Ronald West**
President, Association of Data Communications Users
Manager of Telecommunications and Office Automation,
Shearman & Sterling

## EDITORIAL

# Windows NT isn't the only fish in the 32-bit OS ocean

We've heard so much about Microsoft Corp.'s Windows NT, it's almost as though the product has been shipping for months.

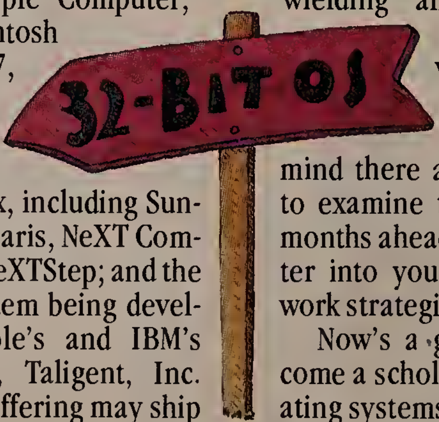
The reality is that NT won't ship until May — the latest word from Redmond, Wash. — and users shouldn't assume NT is the automatic choice for a 32-bit operating system.

NT promises a wealth of integrated network capabilities that could help at the server level or in high-end peer networks.

But, as this week's feature article points out, there are a wealth of other products in the 32-bit operating system arena that can or will provide those capabilities and maybe more (see "The OSes are coming, the OSes are coming!" page 40).

As one network integrator sagely points out, "I caution clients against viewing NT as an extension or upgrade to Windows. It's no more an extension to Windows than Unix is. If you are going to make a fundamental break, you may as well assess all your options."

Consider what's being laid on the table: Apple Computer, Inc.'s Macintosh System 7, IBM's OS/2 Version 2.0; several flavors of Unix, including SunSoft, Inc.'s Solaris, NeXT Computer, Inc.'s NeXTStep; and the operating system being developed by Apple's and IBM's joint venture, Taligent, Inc. The Taligent offering may ship as early as next year. Novell, Inc.'s purchase of AT&T's Unix System Laboratories, Inc. also promises some interesting server twists.



Sure, there's a downside to all this diversity — sometimes you almost long for the days of just plain MS-DOS.

But while Microsoft will be wielding all its marketing weapons to convince you that the future belongs to NT, keep in mind there are other choices to examine today and in the months ahead that may fit better into your enterprise network strategies.

Now's a good time to become a scholar of 32-bit operating systems. ◘

DATABASE UPDATE

BY RICHARD FINKELSTEIN

# A standard database API may not solve all user problems

Database management system vendors have never been very good at adopting standards. For instance, the simple SQL "select" command comes in more varieties than Baskin & Robbins' ice cream.

Recently, there's been talk about standardizing the application program interface (API) used in SQL-based DBMSs. A standard SQL API would enable developers to build applications that would presumably work with any DBMS that supports the standard. The idea is fine in theory, but users cannot overlook the technical and political obstacles that are hindering the emergence of a standard SQL API.

On the technical front, DBMS vendors or third parties have to build software drivers that translate the standard API's request to execute a DBMS function into the corresponding proprietary API used by the target DBMS. Translation degrades performance by introducing another processing step. There's also a chance that the driver will introduce bugs that result in incorrect translations.

Users can also lose functionality because a standard API will likely be unable to request execution of all the target DBMS's functions. There are too many different functions in various DBMSs for them all to be supported by a single standard API.

Furthermore, it would be difficult to continue updating a standard API to provide access to the functions DBMS vendors are continually adding to their products. Every time a new function is added, a new standard API specification has to be documented and adopted by all affected DBMS vendors. Someone then must write new drivers to support these new functions.

So users and third parties will opt to write directly to the proprietary API to use these functions, eliminating any advantages a standard API provides in writing an application that can work with different vendors' DBMSs.

On the political front, there are many vendors developing standard APIs and vying for the SQL Access Group's (SAG) attention. SAG has prepared a specification for a standard SQL API and is now looking to adopt an implementation of that specification as the industry standard.

Users cannot overlook the obstacles hindering a standard SQL API.

▲▲▲

Microsoft Corp. is currently pitching its Open Database Connectivity (ODBC) for adoption as the standard SQL API. ODBC is based on the SAG specification but has extensions that support DBMS functions not covered in the SAG specification. As ODBC's owner, Microsoft decides which functions to include and how they are implemented. Any functions not included in ODBC must be accessed via a "pass-through" mechanism, which avoids the standard API and uses the native API directly.

Not everyone in the DBMS world is thrilled with the idea that Microsoft is trying to control the SQL API standard. Borland International, Inc., IBM, WordPerfect Corp. and Novell, Inc. are jointly developing the Integrated Database API (IDAPI), which will supposedly support relational and nonrelational databases. But it is unclear how IDAPI is going to do this since no one has seen the specification.

Not to be outmaneuvered, Oracle Corp. has announced its likewise nonexistent Oracle*Glue API. In Oracle's case, there is at least some truth in advertising since the ultimate objective of API standards is to glue users to a particular vendor.

IDAPI and Oracle*Glue, like ODBC, are based on the SAG specification but contain proprietary extensions. This gives users the opportunity to choose between proprietary APIs and standards-based proprietary APIs. This is a farce, but DBMS vendors are trying their best to keep a straight face, hoping users will buy into their strategies.

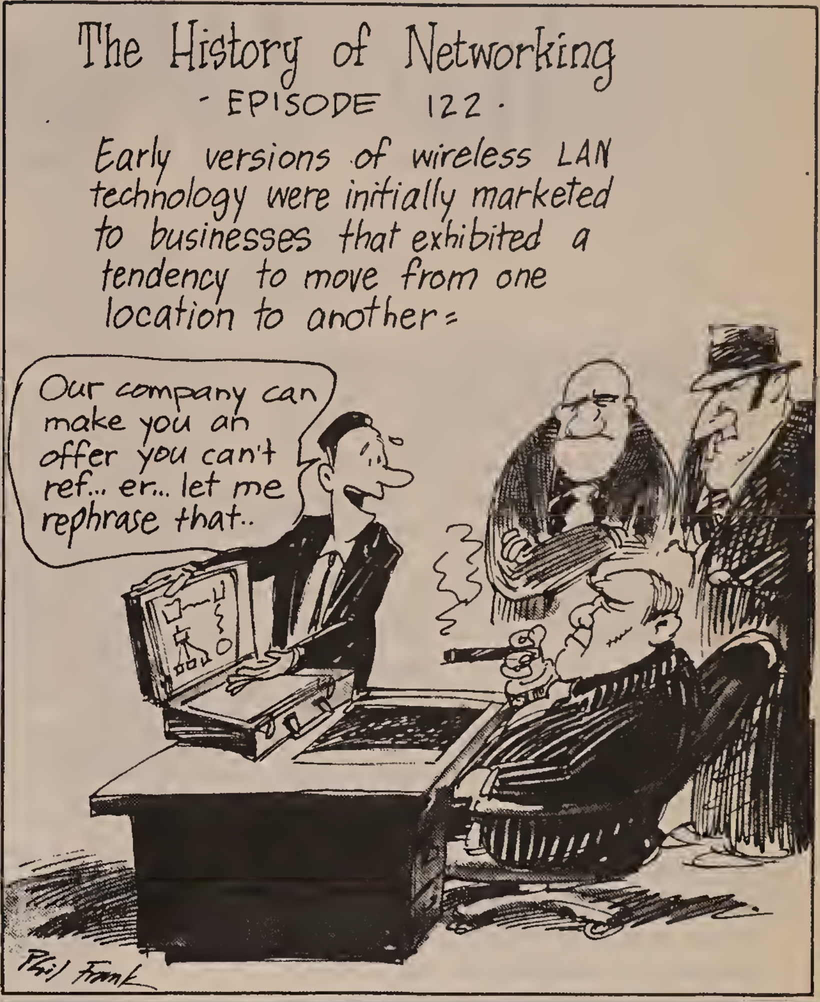
Some vendors are even suggesting the use of multiple standard APIs. However, this means users would have to load multiple translation drivers on their systems and somehow get the drivers talking to each other. The resulting performance, translation and administration problems would be horrendous. In short, the vendors must be pulling our legs when they suggest we stack multiple standards-based proprietary APIs on top of native DBMS APIs.

Over time, standard APIs will likely find some limited use in simple read-only applications. But it is unlikely they will come anywhere close to obviating the need to write applications using proprietary DBMS APIs. ☑

*Finkelstein is president of Performance Computing, Inc., a consulting company in Chicago that focuses on client/server and rightsizing applications.*

## TELETOONS

BY FRANK AND TROISE


The History of Networking
- EPISODE 122 -
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Our company can make you an offer you can't ref... er.. let me rephrase that..
Phil Frank

## LETTERS

**Rumors of death**

A recent article by Jim Duffy ("Single-system mgmt. falling from grace," *NW,* Dec. 21, 1992) quotes four individuals who support the view that single-system Integrated Network Management (INM) technology is dying, if not dead. Yet the article also states that the INM market is expected to grow from $65 million in 1992 to $80 million by 1995.

If this technology is dying, how can its market grow at the same time?

The article also cites BT's decision and the rumored decision by AT&T to withdraw their INM products from the marketplace due to a lack of demand and offer INM services instead as further evidence that INM is a dying technology. However, many business factors, in addition to demand, go into making such decisions. Companies whose predominate revenue historically has come from services are far more likely to feel that their INM offerings should be services rather than products, hence the action by BT.

What has happened to the market is that user expectations have matured. Originally (and ironically), the trade press led potential "manager of managers" (MOM) buyers to expect miracles from INM. Vendor sales literature did not help to temper this optimism. One typical miracle expectation was that once the MOM was in place, the Element Management Systems (EMS) could be discarded, along with a few well-paid network operators.

In fact, the INM system relies on the capability of each EMS to monitor and control its own slice of the network under the MOM's overall direction. The MOM correlates the best data from all other sources, including experienced operators, so as to make the resulting whole

*(continued on page 44)*

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# The OSes are coming, the OSes are coming!

By MARGIE WYLIE

Windows NT is cresting a wave of desktop 32-bit OSes that embrace, and sometimes replace, traditional NOSes.

Network managers are so ravenous for 32-bit operating systems, you'd think they were ready to pour over the edge of the known networking world and into the inky depths of Microsoft Corp.'s Windows NT like lemmings into the sea.

With more powerful personal computers and the craze for downsizing and rightsizing applications, makers of desktop operating systems — which once considered anything beyond the local hard drive or Small Computer System Interface port beyond their jurisdiction — are rushing to build operating systems that don't just tack on networking as an afterthought. Rather, these vendors are designing operating systems to complement, take advantage of or even try to replace traditional network operating systems (NOS).

While Windows NT is the most visible example of that trend, it is far from the only one. Many from the crop of new 32-bit operating systems either recently out or scheduled to ship in the next year are network-aware to one degree or another.

So whether the choice is Windows NT, Apple Computer, Inc.'s System 7 (for the Macintosh), IBM's OS/2 or a Unix-based system such as SunSoft, Inc.'s Solaris or NeXT Computer, Inc.'s NeXTStep, you'll find a rich and growing complement of network capabilities.

Although many users have been swept up in Microsoft's push toward Windows NT, users would fare well to consider all their options.

"One thing I have to caution our clients against is viewing [Windows] NT as an extension or an upgrade to Windows; it's no more an extension to Windows than Unix is," says Stephen Basile, manager of engineering services at ERI, a Hauppauge, N.Y., network integration and consulting firm. "If you are going to make a fundamental break, then you may as well assess all your options."

### Network awareness

"Network awareness is going to be one of the competitive points on which 32-bit operating systems will succeed or fail," says Jamie Lewis, a principal analyst at The Burton Group, a Salt Lake City research firm.

Every operating system company defines "networkability" a little differently, depending on the firm's background, what it thinks its users need and where it sees networking going. Most operating systems today concentrate on being good clients to existing servers by supporting multiple protocols and building in peer-to-peer net capabilities.

ILLUSTRATION ©1993 MANUEL KING

Beyond that, many desktop operating system makers are building frameworks to include an ever-widening variety of more sophisticated services such as directory and database services, electronic mail, remote procedure calls and security services.

Frameworks such as Microsoft's Windows Open Services Architecture (WOSA), SunSoft's Solaris Federated Services or Apple's Open Collaboration Environment (OCE) will free developers to create net applications that don't have to be tied to one set of services or protocols, Lewis says.

### Importance of frameworks

Applications could be more plentiful across different computing platforms but aren't because software is difficult to build, according to Lewis. "Developers need to be able to use whatever network services the user has without having to write directly to those services," he says. "That's why architectures like WOSA and OCE are so important."

These multiletter acronyms won't mean much to end users, says Lewis, but they will make or break application development, which will indirectly affect which operating system wins the most market share.

These multiservice frameworks will lessen a developer's pain because of several factors. For example, an application that needs store-and-forward messaging services today would have to choose one service, such as Novell, Inc.'s Message Handling Service (MHS). This scheme limits where managers can apply the program — on a network that uses MHS.

Under WOSA or OCE, that same application would make generic calls to a single interface that would, in turn, pass those commands onto whichever store-and-forward service is available at the time. This too, is a less-than-perfect solution because the functions that any application can use are limited by the Application Program Interface (API) through which it calls the service. For example, MHS might support addressing one message to multiple users, but if WOSA's interface doesn't, developers cannot take advantage of that feature. But until operating systems exist in the perfect object-oriented world (see "Taligent's brave new 'digital multiculturalism,' " page 43), APIs are a good interim solution.

### System 7

Built-in networking is hardly new to Apple. The company introduced the

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first network-ready desktop operating system in the mid-1980s with its Macintosh. The firm beat the rest of the operating system world to the punch again when it shipped System 7 in May 1991.

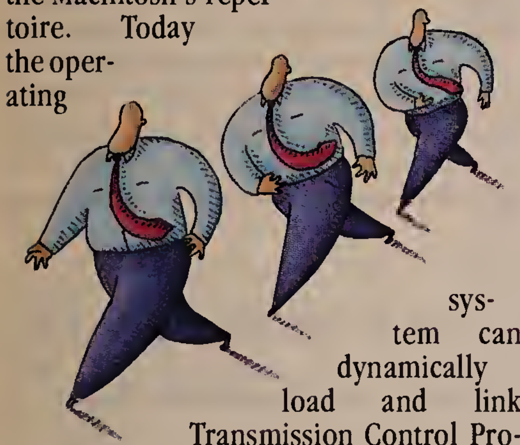
**System 7**

"People now are seeing that this is the next wave, that rather just being a computing device, [desktop machines] are communications devices. But that has been the idea from the start with the Macintosh," says Dan Torres, networking and communications product manager for Apple's Enterprise Systems Division.

The 32-bit operating system offers users not only built-in AppleTalk connections to printers or servers, but it also comes with peer-to-peer networking capabilities.

Macintosh File Sharing allows any Macintosh running under System 7 to advertise all or part of the contents of its hard drive as available for sharing over an AppleTalk network. Any user on the network, including System 6 users, can log on to a disk volume as long as they are running AppleShare client software. AppleShare is Apple's dedicated server software, which is sold separately; client software comes free with the Macintosh operating system.

Apple's Enterprise Systems Division also continues to add protocol stacks to the Macintosh's repertoire. Today the operating system can dynamically load and link Transmission Control Protocol/Internet Protocol and Open Systems Interconnection stacks concurrently with applications, in addition to its native AppleTalk. And Novell and Apple are working on developing a NetWare Internetwork Packet Exchange (IPX) stack for System 7, which is expected out sometime this year.



At the application level, Apple has been developing an architecture and a set of services it calls OCE. Due out in the first half of this year, OCE will offer application developers Apple's own store-and-forward messaging service, directory service, and encryption and authentication services through a standard set of APIs. Building these critical network services into the operating system means that application developers don't have to write their own services or tailor applications to services.

Apple is also offering a back-end API that will let other vendors plug their own services — like Banyan Systems, Inc.'s StreetTalk directory service or store-and-forward services such as Novell's MHS or Microsoft's Microsoft Mail — into OCE.

Apple plans to build some of these modules itself, such as an X.400 E-mail module, but like Microsoft, it has to rely on the goodwill of other vendors — which are essentially their competitors — for the rest.

**Taking the NeXTStep**

In the Unix world, NeXTStep has so far carried on in the tradition of innovation sans market share that its founder, Steve Jobs, began at Apple.

But the company hopes to avoid the Macintosh's fatal flaw in the network world — dependence on proprietary hardware — with NeXTStep 486.

Due out sometime this year, the Intel Corp.-compatible operating system will offer the same array of cross-platform compatibility and typical Unix networking capabilities currently available in NeXTStep 3.0.

Built-in AppleShare and NetWare clients and protocol stacks will let users log on to Macintosh and NetWare servers. NeXTStep 3.0 will also store DOS and Macintosh file formats in addition to its own and can mount floppy or hard disks formatted under the two operating systems. It comes with AppleTalk, IPX and TCP/IP network protocols, but others can easily be added under its Unix Streams interface, says Kevin Wells, director of software engineering at NeXT.

For peer file sharing, NeXTStep supports Sun's Network File System (NFS). "NFS is essentially peer-to-peer although it's rarely used that way," he says. "It's similar to [System 7's] file sharing, but it's a little more cumbersome because there's Unix underneath."

With NFS, users can advertise all or part of their disk space as a server and log on to other NFS servers via TCP/IP. It also supports printer sharing through Unix's Line Printer Daemon.

Unlike many of its competitors, NeXT doesn't offer any neatly packaged "acronymified" architecture to wrap around its APIs or one of the fundamental concepts that NeXTStep was built on: service re-

*(continued on page 42)*

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*(continued from page 41)*

placeability.

"All of our services can be swapped out," Wells says. What makes it different from OCE and WOSA is that it exists today and it uses NeXTStep's object orientation to keep services a discrete distance from the operating system kernel.

"NeXT's services allow any application to offer its services to another application," he adds.

One typical Unix function that NeXT cannot live up to is sharing applications over the network, Basile says.

"Its primary advantage, something that Steve Jobs waves around like a flag, is its [object-oriented] development environment and how easy it is to develop a truly object-oriented application," he says. "But that application will run only on NeXT workstations. I can't access it from a Sun device, an HP workstation or an X terminal."

**OS/2 survives**

Last April, IBM breathed new life into OS/2 when it began shipping Version 2.0 of the operating system. New features, such as its Workplace Shell, make it easier to support multiple NOS clients in a mixed local-area network environment.

The operating system upgrade also made it possible to run unmodified Windows, DOS and OS/2 1.3 applications. But the operating system's Workplace Shell is the one new feature that has been received well by users.

"All of this stuff just plays so well together, I have a great deal of confidence in it," says Don Babcock, manager of user services at Cajun Electric Co. in Baton Rouge, La.

Last April, IBM breathed new life into OS/2 with Version 2.0.

▲▲▲

The Workplace Shell is the desktop portion of a graphical user interface that iconically represents all services and applications available to users on any of the environments that the operating system supports. Users drag and drop files between servers or from the server to the printer. They do not have to know whether a file belongs to a Windows application or if a NetWare client is running DOS in order to use them.

One of the slickest enhancements IBM made to OS/2 has been its support for the Procedural Language/2 Restructured Extended Executor Language (REXX), an extended batch language. IBM integrated REXX into the Workplace Shell so that users could create simple batch files and iconize them to create their own automated routines.

In addition, IBM extended REXX to support the High Level Language API (HLLAPI) in tandem with IBM's Communications Manager subsystem.

"That's been a real boon to us," Babcock says, adding that users can now click on an icon that kicks off a routine to log them on to [IBM's] DB2 at the mainframe and pulls up a variance report, plot the information and drag it down to the workstation. "That used to be an eight- to 10-step process, but REXX automates it all now into one click of the icon," he adds.

Analysts, however, have a different perspective.

"That's great for true-Blue shops, but IBM is missing the boat when it comes to an architecture that lays OS/2 open to other net services," says The Burton Group's Lewis. "If you look at architectures like WOSA, IBM has outlined nothing that comes close."

One advantage that OS/2 offers is that it maintains a full range of functionality with IBM's LAN Server network operating system, says Scott Haugdahl, a senior technical consultant with Architecture Technology Corp., a Minneapolis consultancy. That means it supports the same Network Basic I/O System and Server Message Block (SMB) interfaces supported in LAN Server. Such support allows OS/2 to provide a high level of application compatibility with other operating systems that support those protocols.

But Haugdahl cautions that users may be leery of performance. "One thing developers tell you is SMB does not make a good services protocol since it's tied into DOS." The limitation, he says, is that it is restricted to file sharing modes.

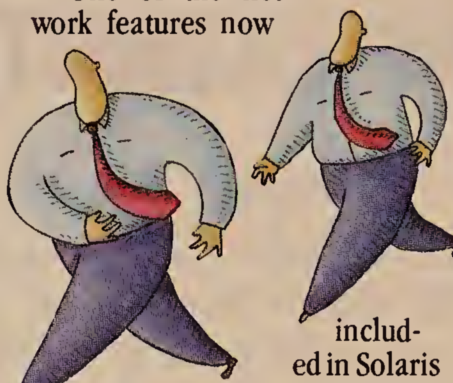
But when IBM announced OS/2 Version 2.0 in October 1991, it took great pains to point out that it improved OS/2 performance due to the inclusion of new file system drivers, use of a flat memory model and other measures.

**Here comes the Sun**

Hoping to eclipse other luminaries in the heavenly field of 32-bit operating systems, Sun's subsidiary SunSoft last June released Version 2.0 of its Solaris operating system, which gave the operating system network capabilities.

Initially, Solaris 2.0 ran only on Sun's SPARCstations and servers, but SunSoft quickly followed up by offering Solaris for X86, which runs on Intel 80X86-based machines. By the end of June, SunSoft had demonstrated Solaris 2.0 on PCs from Dell Computer Corp., Zenith Data Systems Corp. and CompuAdd Corp. Other PC makers also pledged support.

Then, just four months later, SunSoft served up Version 2.1 for free and said it plans similar upgrades about every six months after that.



One of the network features now included in Solaris 2.1 is Network Information Services Plus (NIS+), which is a component of the company's Open Network Computing Plus (ONC+). ONC+ is a new and enhanced version of Solaris' core distributed computing technology, ONC.

NIS+ is a central data repository that makes network administration easier. NIS+ enables net managers to perform network-related tasks in batches on groups of workstations rather than one by one. With NIS+, "you're able to do an update in a matter of seconds as opposed to a matter of hours," says David Taber, group product manager at SunSoft.

Solaris 2.1 also now includes full symmetric multiprocessing and multithreading capabilities that increase system performance by speeding up I/O processing.

Other ONC+ features such as local disk caching for improved performance and connection-oriented protocol support for access to NFS servers via low-speed links are scheduled to be included in future releases of Solaris this year. Taber refuses to elaborate specifically on when those features will be available. "It's on our road map," he says.

The company also has plans to incorporate object-oriented technology into Solaris through agreements with several companies that specialize in object orientation. "We're setting the foundation to convert our desktop and administrative applications over to an object system," he says.

Also on the networking front, SunSoft offers Federated Services Interface (FSI) APIs. FSI APIs allow application developers to choose from a list of various filing, naming and security systems in addition to the ONC+ services that ship with Solaris, easing network application development.

Not all FSI APIs are available, however. SunSoft plans to release them gradually with its incremental upgrades and won't give details about which ones will be ready or when. Taber did say, however, that security APIs — which allow developers to choose between Kerberos, Data Encryption Standard, standard Unix or RSA Data Security, Inc. technology — are coming and that the Name Services API, which is available now, will be enhanced in future releases.

In all, it looks as if Solaris' star is rising, but it's going to be a very slow and gradual dawn.

**NetWare's destiny**

Perhaps the darkest horse in this race is UnixWare, from the Novell and Unix System Laboratories, Inc. (USL) joint venture, Univel. Based on Destiny, USL's Unix System V Release 4 implementation, UnixWare's definition of network awareness is the same as NetWare awareness.

"We are focused on complementing and fitting into existing NetWare environments," says Mark Epstein, architectures and planning director for Univel.

The most celebrated of the emerging 32-bit operating systems is Windows NT.

▲▲▲

The operating system comes in two versions, Personal Edition, a scaled-down desktop version, and Application Server, a full-blown Unix implementation.

With a name like UnixWare, users might expect to find a NetWare server in every box. It isn't there.

Both the desktop and server editions are still unmistakably Unix and are designed not to be a Unix-based NetWare server, but rather a Unix application server to NetWare networks, Epstein says. Personal Edition comes with TCP/IP and IPX stacks, as well as a NetWare client. Server Edition also comes with IPX and TCP/IP support, as well as other services aimed at allowing NetWare clients to use Unix applications.

X Window System-over-IPX support extends X Window applications to NetWare clients. Those clients, however, will also need an X Window terminal emulator that uses IPX to take advantage of this feature. Several Windows versions are being developed now. Server Edition also supports Novell's Service Advertising Protocol, which will allow NetWare clients to call up Unix applications under IPX without navigating the network or using TCP/IP conventions.

Univel has said it will port NetWare for Unix to run under UnixWare but hasn't announced when that will occur. Now that Novell has bought controlling interest in USL from AT&T, that question seems to be on the back burner. However, according to a Univel spokeswoman, don't look for UnixWare to change that much even after Univel becomes a wholly owned subsidiary of Novell.

**Windows NT**

The most celebrated of the emerging 32-bit operating systems, Windows NT will pattern its networking capabilities after Unix's assurance of service availability and peer services. But Windows NT will be based on the company's LAN Manager NOS instead of TCP/IP.

Windows NT desktops will be able to act as both servers and clients to other Windows NT workstations. Also, DOS and Windows 3.X workstations running the LAN Manager client will be able to log on to a Windows NT machine the same as any LAN Manager server today.

Unlike many peer-to-peer solutions, Windows NT will offer the same security levels and features available in Microsoft's full-blown NOS. That should make the network a little more manageable than traditional peer NOSes since only administrators, not the local users, will be able to enable, disable or change server options or alter access privileges.

Still, each machine will have to be administered separately until Microsoft ships LAN Manager for Windows NT, which will provide a domain naming service needed to create administrative groups. The new NOS version will allow network managers to group Windows NT servers and users into logical domains in order to manage them systemwide, rather than logging on to each Windows NT system on the network individually.

Such tight integration between Microsoft-only products have led many observers to say that Microsoft is trying to force users into buying only their operating systems for the desktop, work group and enterprise network. Microsoft says that simply isn't so.

Like any other desktop operating system, Windows NT will also be able to accommodate a NetWare client when it becomes available from Novell. Windows NT will let users run multiple protocol stacks over the same network interface card. Combined with Windows NT's multithreaded nature, that will let users run the NetWare client in tandem with the Windows NT's client so users can issue requests to either server without having to log off one net and log on to the other.

Novell says it is committed to releasing the NetWare Requester for Windows NT but seems to be dragging its feet in developing the client.

Meanwhile, there has been some bickering between Novell and Microsoft over the IPX stack. Microsoft wants to ship IPX with Windows NT, (as it did with Windows 3.X), but Novell claims it doesn't have the legal right to do so. Windows NT will ship with a NETBIOS (LAN Manager) stack and a TCP/IP stack.

Windows NT will also be based on WOSA, a multiservice architecture. Unlike Apple's OCE, WOSA isn't a single set of services and APIs that will come out all at once. Rather, it has already started oozing out in bits and pieces, such as its Messaging API (MAPI) interface. When complete, the architecture will support multiple types of back-end services through a single interface.

Today, Microsoft is working on APIs for E-mail (MAPI) and database access (Open Database Connectivity), but WOSA is also expected to offer swappable directory, encryption and other services.

The first version of Windows NT is expected to ship with an MAPI-compatible client based on the company's Microsoft Mail E-mail system. The client will allow users to designate one Windows NT machine as a "post office" for one work group.

As with LAN Manager, Microsoft is also working on a Windows NT-compatible mail server, but it is expected to ship and sell separately from Windows NT.

Still, Windows NT isn't even a consideration for Cajun Electric's Don Babcock. He says his company initially committed to OS/2 because Microsoft chairman Bill Gates promised it was a strategic product, only to drop it later.

"Microsoft seems to run something up the pole and waits to see if anyone salutes before deciding if they might go with it," Babcock says. "You can't count on a product until you have it in hand." By contrast, he says, IBM has been much more open about OS/2, and has gladly accepted user suggestions.

**So who needs Novell?**

With all this networking built into nearly every desktop operating system, the next logical question is, why pay for a server when you can get it built into the operating system? While there's no doubt that peer-to-peer enabled desktop operating systems will cut into Novell's low-end market, most vendors and analysts agree that it isn't leading to serverless corporate nets anytime soon.

"[Microsoft's] Windows for Workgroups may serve some work groups and maybe even some departments well," says The Burton Group's Lewis. "But there's a myth currently being perpetrated that somehow [peer-to-peer] will be easier to use and manage than client/server."

However, that's not so, he adds. Built-in peer-to-peer networking schemes will generate more traffic and create security and backup holes in a large network.

"Peer-to-peer networking will only be marginally successful because of its inherent complexity across a large number of users," says William Donahoo, director of marketing for Novell's Desktop Systems Division based in Provo, Utah.

Microsoft will also be the first to point out that while Windows NT will make a great application server or work group server, it lacks the administration and directory services users need in order to keep a group of servers in an enterprise network running smoothly. Users will have to buy LAN Manager for Windows NT to do that.

**Nothin's for free**

As 32-bit operating systems begin to develop more sophisticated services, expect to see fewer and fewer freebies — such as drivers, multiple stacks, client shells — at the desktop.

Apple already sells its protocol stacks separately and has said it will likely sell its OCE separately, too.

Novell says it will continue to integrate its NetWare Lite peer-to-peer networking capabilities with DR-DOS and its 32-bit OS, UnixWare. But it will always sell them separately. Donahoo says the NetWare basic client will always come free, but as Novell adds more capabilities to the

*(continued on page 44)*

# Taligent's brave new 'digital multiculturalism'

Shopping for a 32-bit operating system now? Taligent, Inc. can't help you just yet.

But the joint venture between IBM and Apple Computer, Inc. will want to play "Let's Make a Deal" with you in the next two or three years. That's when it hopes you'll trade your operating system for what's behind curtain No. 2: an object-oriented 32-bit operating system code-named "Pink."

"Pink is the first operating system designed with heterogeneity from the start," says Mark Vickers, director and chief technologist at Taligent. "We are built around a concept I like to call 'digital multiculturalism.' "

That means Pink won't be built around one primary set of protocols, flavor of electronic mail or type of network hardware that is then extended to accommodate others, Vickers says. Instead, it will be built to immediately accommodate all the different "cultures" of protocols and services that exist in organizations today.

Pink's object-oriented technology will make today's flood of different network protocols and services equally and transparently available, a boon to both users and developers. Overlaying this will be a graphical desktop interface that will offer icons that reflect not only a user's local environment, but also the user's network environment.

**Networking in abstract**

"Today, if you look at most operating systems, they were designed for one first-class protocol: Unix has TCP/IP, and Apple was built around AppleTalk," Vickers says. "[In Pink] no one protocol is favored over another."

The operating system will buffer applications and users from knowing what protocols they are using through "abstractions." These are software objects that reside on the client workstation whose job it is to intercept client requests and decide how to process them.

For example, if a Pink client needs information from a NetWare server, the application never has to know where the information is stored or what protocol it needs to reach that information. It simply requests the data from a server abstraction within Pink. The server abstraction then dynamically loads the stack and makes the connection.

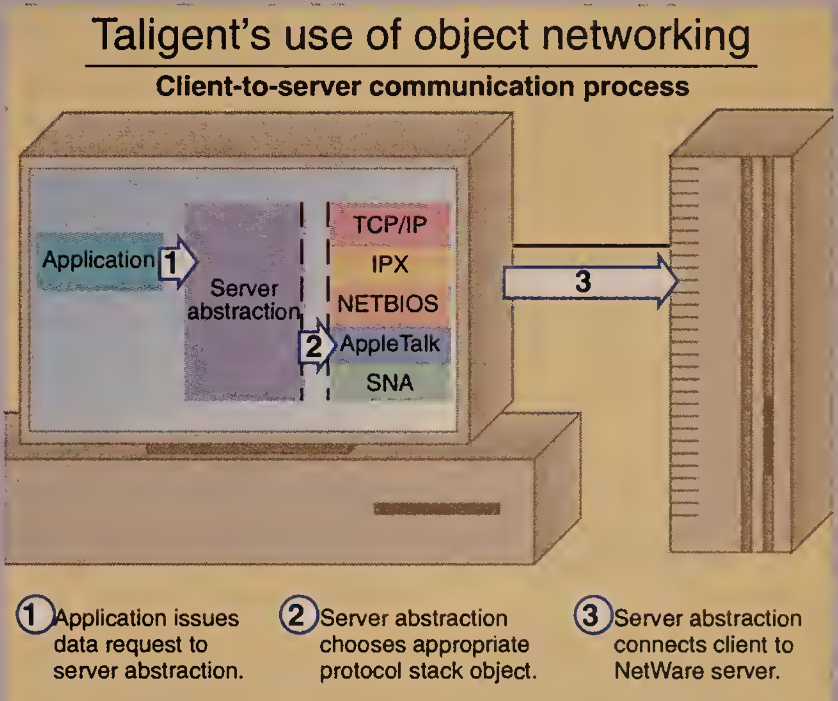
The aim is similar to what Microsoft Corp. is proposing in the Windows Open Software Architecture (WOSA), but WOSA uses the same old procedural programming techniques that have held networking progress back for years, according to Vickers.

"We know that we have very high-speed networking capabilities and brand-new ideas in database and other innovations that have been around for years but haven't been delivered. The reason is, [application program interfaces] haven't caught up to [those technologies] and developers haven't caught up to the APIs," Vickers says. Pink would allow network protocols to develop independently from applications and the APIs they depend on in today's procedural programming environment.

Extend those same ideas to any network service — from E-mail to printing to naming services and security — and applications will be able to run in any networking environment. Pink's underlying abstractions would swap out protocols and services as needed, and users and in-house software developers would never need to know or understand multiple environments.

"We recognize the fact that each computer community has a unique set of services including network protocols, E-mail systems, file systems and specific file formats [that are] built around the needs of that group. We built [Pink's] systems not to pick particular winners, but to basically allow software to adapt to a company's existing infrastructure," Vickers says.

Instead of cobbling networking onto its desktop interface as an afterthought like most current operating systems, "Pink was designed with the notion that users are connected either continuously or intermittently to a rich digital landscape of services and other people," Vickers says.


Taligent's use of object networking
Client-to-server communication process
Application
1
Server abstraction
TCP/IP
IPX
NETBIOS
2
AppleTalk
SNA
3
① Application issues data request to server abstraction.
② Server abstraction chooses appropriate protocol stack object.
③ Server abstraction connects client to NetWare server.

GRAPHIC BY SUSAN SLATER

SOURCE: TALIGENT, INC., CUPERTINO, CALIF.

"We recognize the fact that the most important work people do tends to involve [network] services and other people beyond the computer sitting in front of them," he says.

In today's one-user desktop, services and other users appear as extensions to the disk. Pink proposes a new metaphor that doesn't constrain the view of the network through a single-user metaphor.

But just what this new interface looks like and how it works is still a secret.

**Slow gestation**

If Pink sounds like the operating system for your networking needs, don't call Taligent until the "mid-'90s" when the operating system is expected to ship. And it may be sometime after that before the platform builds up a rich variety of applications since programmers will have to recast their programs in object-oriented code to take advantage of Pink's full capabilities.

The first versions are expected to run on Intel Corp. personal computers and computers based on IBM's Power PC Reduced Instruction Set Computing chips. Everything else, including specific network and E-mail protocols, are Taligent's closely guarded secrets.

"The real proof is in getting it out to people. And we're more anxious than you to do that," says Vickers, who has been working on the project since 1988, when it was still at Apple.

— *Margie Wylie*

## Gupta revs up tool for apps

*continued from page 8*

phism and single- and multiple-inheritance. It provides extensive on-line help to SQLWindows developers who want to build new classes of objects using SQLWindows object-oriented programming language. However, programmers are not required to use object-oriented programming to build SQLWindows applications.

To help get developers started, SQLWindows 4.0 comes with 20 predefined objects or templates for building commonly used application elements.

Other features of SQLWindows 4.0 include support for Object Linking and Embedding (OLE) and numerous enhancements to the user interface and report capabilities.

Besides SQLWindows 4.0, Gupta also announced two new versions of Quest. Quest 2.0 and 2.1 provide enhanced security and reporting, support for Microsoft's OLE and the ability to install and de-install individual Quest activities. The new versions also support Informix Software, Inc.'s SE and On-Line, IBM's OS/400 and Hewlett-Packard Co.'s Allbase/SQL databases.

Version 2.1 also provides a capability that lets users create forms for querying and entering SQL data rather than working directly from a database table.

SQLWindows 4.0 will be available by the end of this quarter and will be priced between $1,995 and $3,495, depending on the level of functionality desired. Quest 2.0 will ship in March for $595, and Quest 2.1, which contains the Forms capabilities, will ship in June to Quest 2.0 customers at no extra charge.

## The OSes are coming!

*continued from page 43*

desktop, it will not bundle them with its desktop operating system offerings.

**The hype! The hype!**

Whether it's true or not, many operating system makers believe that there is an ongoing war. It's a war for the souls and networks of the next generation of computers.

With few 32-bit operating systems actually on the market, however, the first battle is mostly a clash of acronymns, accusations, claims and counterclaims. "The hype is insane," says Brent Williams, a Mountain View, Calif.-based analyst with International Data Corp. "The stakes are high, and it's not about money, it's about control."

ERI's Basile offers this advice: "Take everything the vendors have to say with a grain of salt." He recommends that users pour over and question every glib claim.

"Saying you support a standard and supporting it to its entirety are two different things," he says.

Microsoft, for example, claims that Windows NT supports TCP/IP. "TCP/IP implies to a Unix user a suite of utilities, like [File Transfer Protocol], RShell [for remote shell], RLogin [for remote login] and Telnet. You can Telnet out of a [Windows] NT box but not into a [Windows] NT box," Basile says. "Telnet is always two-way, except in Microsoft's implementation."

Sun also claims that 5,000 applications are available to run in Solaris environments. Although that is true, they only run on a SPARCstation. Expect only about 1,000 of those to run initially on Solaris for Intel-based PCs, according to Basile.

As products emerge, beta testers begin to share their experiences and users float trial baloons in-house, the fact will begin to filter from the fiction. Only then will network managers have a clear understanding of which product best suits their needs.

*Wylie is a San Francisco-based free-lance writer who specializes in networking and communications technologies and issues.*

## TQM programs are lacking

*continued from page 37*

improve customer-defined satisfaction levels.

The study found that the key to successful TQM programs included long-term, companywide commitment. It takes approximately four years before companies can fully develop the attitudes and working practices TQM requires, DiRomualdo said, and companies must be willing to adopt a sustained program.

In addition, the program should be driven from the top. TQM initiatives are destined to fail unless the head of IS and key managers are committed to the effort from the beginning, according to DiRomualdo.

Other major points were a focus on the customer, a corporate environment that encourages change, and a good system for measuring improvements and registering feedback.

For a copy of the study findings, call CSC Index at (617) 492-1500.

## Coalition backs XAPIA effort

*continued from page 8*

Last week, the VIM Interface group proposed that it would contribute to the Common Mail Calls APIs, several of which are due to be completed by midyear. Also, the group asked that XAPIA contribute to the VIM Interface, as well.

"We want to achieve clarity and emphasize the importance of collaboration" in the area of messaging APIs, said Tim Dempsey, manager of developer relations at Lotus and acting chairman of the VIM Interface group.

He added that the group will continue to work on a full-function VIM Interface for complex messages but will support XAPIA's Common Mail Calls as well as a lowest common denominator.

**Nationwide is on VIM's side**

At a VIM Interface group update meeting held at NetWorld 93 Boston here, Mark Ramsey, manager of technology at Nationwide Mutual Insurance Co., said a common messaging API will enable users to integrate the best-of-breed messaging components.

Nationwide recently installed a legal department automation system that would have been much easier to build if there had been a calendaring application supporting the VIM Interface at the time, Ramsey said. The firm had to build its own calendaring system to work with its cc:Mail messaging platform, he added.

Suzan Fine, product manager for Microsoft API, Microsoft's Windows-based messaging API, said she welcomes the VIM Interface group's support for XAPIA's effort "if that's what they are really announcing." She said the VIM Interface group's intentions were still not entirely clear to her.

> A common messaging API will enable users to integrate the best-of-breed components.
>
> ▲▲▲

Fine, Microsoft's representative to XAPIA's executive committee, said XAPIA will likely call an executive subcommittee meeting to review the VIM Interface group's proposal.

## Microsoft unveils client

*continued from page 8*

formation Services and MCI Communications Corp.

Microsoft Remote Client for Windows requires Windows 3.1, an Intel 80386 or higher processor, 2M bytes of memory and a modem. It will be available in April for $195.

Users of Microsoft's remote DOS mail product can upgrade for $50.

The company's new Microsoft Mail 3.2 server supports X.25 and an administration capability that allows E-mail managers to establish groups of users and move information about those groups from one directory to another. The upgrade does not require changes to client software.

Microsoft also announced the Multitasking Message Transfer Agent (MTA), which enables multiple remote users to dial into the same message post office simultaneously without getting a busy signal.

The Microsoft Mail 3.2 server update and the MTA will be available in March. The server upgrade costs $695, and users can upgrade from Microsoft Mail 3.0's server for $195. The MTA costs $1,995.

## Letters

*continued from page 39*

more than the sum of its parts.

To make intelligent use of an INM product, users must first have a coherent network management strategy that the INM system can model.

The real reason for the rising popularity of such local-area network management platforms as Hewlett-Packard Co.'s OpenView and Sun Microsystems, Inc.'s SunNet Manager is that they facilitate the modeling, encoding and description of that strategy, thereby taking that important first step toward true enterprise INM.

When the users of these platforms need to incorporate global populations into their INM environments — as they surely will — only a fully featured single-system INM product will fill the bill. Then industry observers will certainly discover that these products have been "restored to grace."

Thomas Hikoski
Vice president
Network Management Services
Nynex Allink Co.
White Plains, N.Y.

*Editor's note: AT&T's Accumaster Integrator accounts for about 80% of the $65 million MOM revenue for 1992, according to Northern Business Information (NBI), leaving $7 million split among the remaining MOM vendors. As stated in the article, NBI claims the market will grow to $80 million in 1995 only if the Integrator stays on the market. The article did not make clear, however, that NBI predicts the market will decline to $38 million in 1995 if the Integrator is withdrawn.*

**What I meant to say**

Ellen Messmer's article on the National Science Foundation's (NSF) selection of three vendors to provide information services for the Internet and the coming National Research and Education Network ("Three firms win Internet, NREN info services deals," Jan. 11) was well written and generally accurate.

However, a statement attributed to me in the concluding paragraph is somewhat misleading. The statement claims the NSF expects to develop a new policy within 18 months that will limit the types of organizations that can receive free Internet Protocol address registration from Network Solutions, Inc. Since this paragraph resulted from an apparently erroneous impression left by my conversation with Ms. Messmer, I'd like to clarify any confusion I may have caused.

What I discussed with Ms. Messmer was that under the current arrangement, NSF, by default, pays for the issuance and maintenance of registration information for international, other federal (nonmilitary) and commercial organizations that are outside of the community that NSF is charged to support.

I indicated that, given this situation and the Federal Networking Council's policy of recovering costs from users, we would be discussing with the Internet community the possible imposition of some sort of onetime or recurring fee. Over time, that fee would make the registration process independent of the NSF or other federal support. The current arrangement will eventually have to change, but no conclusions have yet been reached as to how this may be done.

The NSF expects to engage in a discussion with the domestic and international Internet community on the motivation, strategy and tactics of imposing fees for these services during the next 15 months. Decisions will be implemented only after they have been announced in advance and an opportunity has been given for public comment.

Donald Mitchell
Staff associate
Division of Networking and
Communications Research
and Infrastructure
NSF

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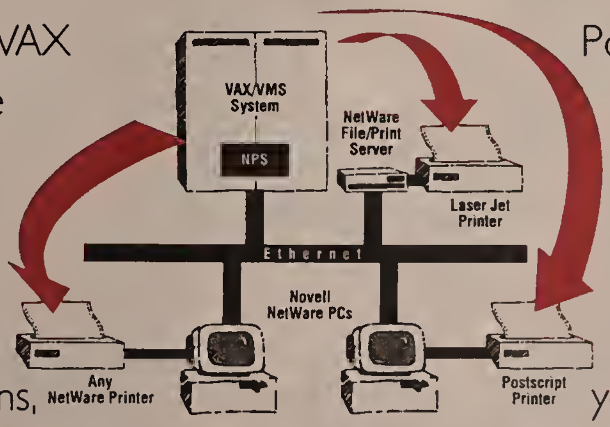

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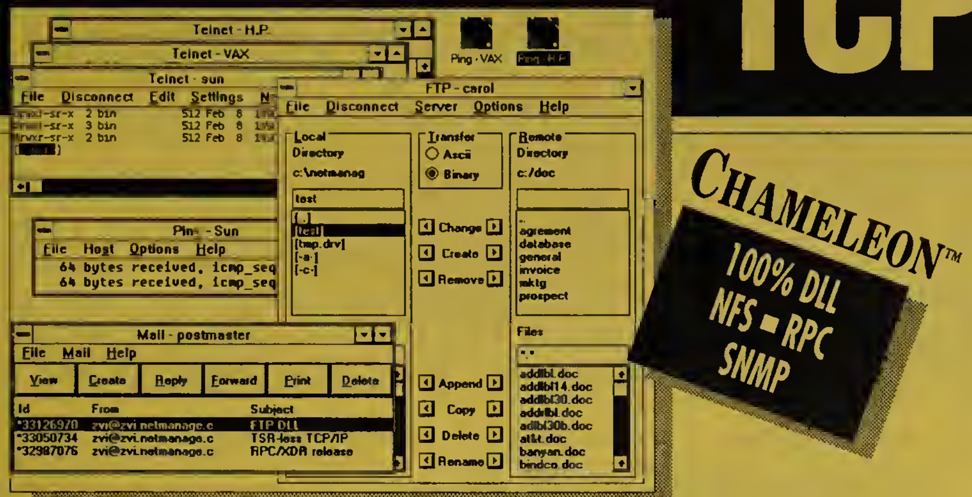

```
drwxr-sr-x  2 bin   512 Feb  8
drwxr-sr-x  3 bin   512 Feb  8
drwxr-sr-x  2 bin   512 Feb  8
```

test
[..]
[test]
[tmp.drv]
[-a-]
[-c-]

agrement
database
general
invoice
mktg
prospect

*.*
addlbl.doc
addlbl14.doc
addlbl30.doc
addrlbl.doc
adlbl30b.doc
at&t.doc
banyan.doc
bindco.doc

```
64 bytes received, icmp_seq
64 bytes received, icmp_seq
```

| Id | From | Subject |
|---|---|---|
| *33126970 | zvi@zvi.netmanage.c | FTP DLL |
| *33050734 | zvi@zvi.netmanage.c | TSR-less TCP/IP |
| *32987076 | zvi@zvi.netmanage.c | RPC/XDR release |

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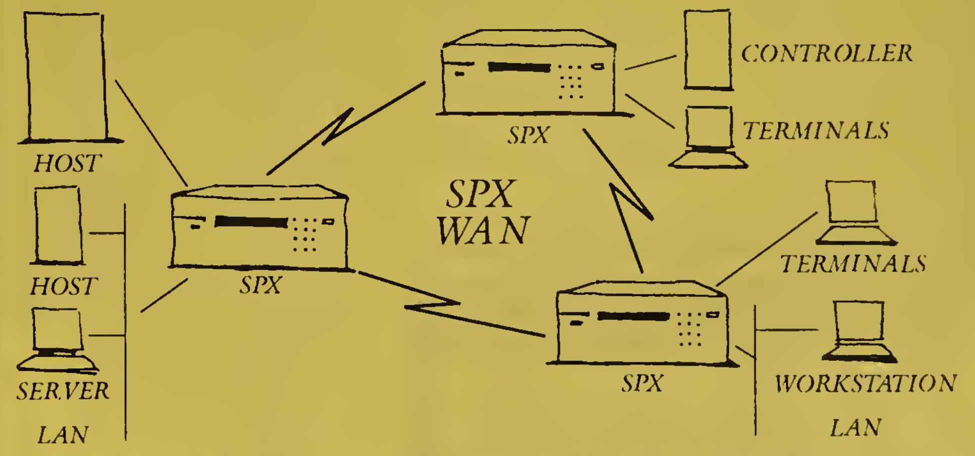

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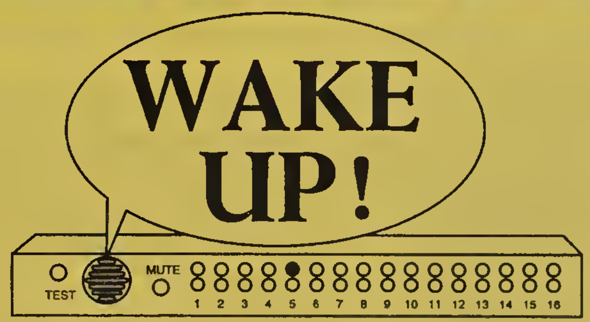

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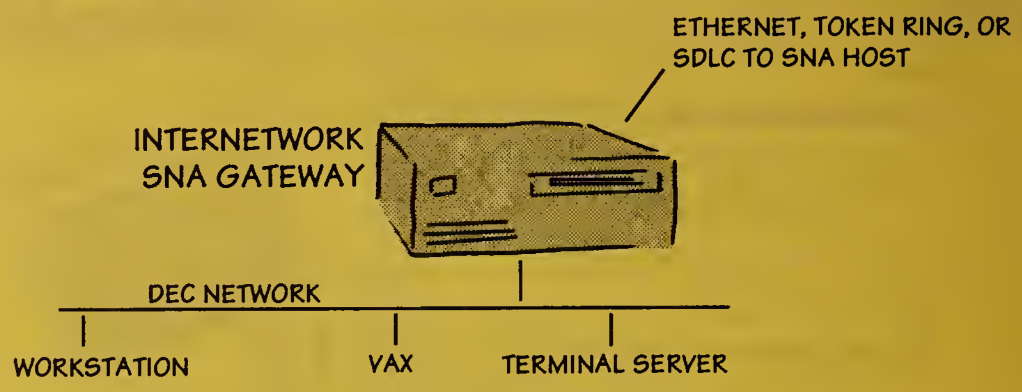

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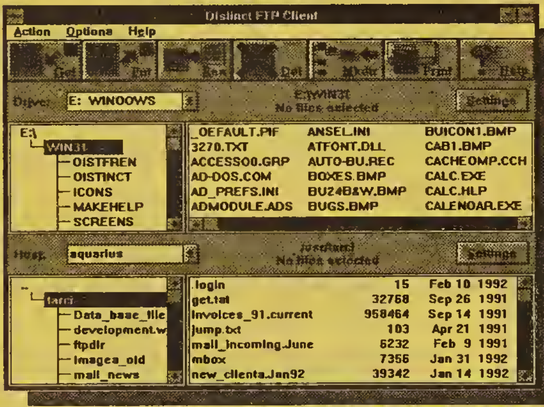

```
E: WINDOWS        E:\WIN31
                  No files selected
E:\
 └WIN31
   ─DISTFREN      _DEFAULT.PIF     ANSEL.INI       BUICON1.BMP
   ─DISTINCT      3270.TXT         ATFONT.DLL      CAB1.BMP
   ─ICONS         ACCESS00.GRP     AUTO-BU.REC     CACHEOMP.CCH
   ─MAKEHELP      AD-DOS.COM       BOXES.BMP       CALC.EXE
   ─SCREENS       AD_PREFS.INI     BU24B&W.BMP     CALC.HLP
                  ADMODULE.ADS     BUGS.BMP        CALENOAR.EXE
aquarius          /usr/tarci
                  No files selected
 ..
 └tarci
   ─Data_base_file    .login                  15   Feb 10 1992
   ─development.w     get.tat              32768   Sep 26 1991
   ─ftpdir            invoices_91.current 958464   Sep 14 1991
   ─images_old        jump.txt               103   Apr 21 1991
   ─mail_news         mail_incoming.June    6232   Feb  9 1991
                      mbox                  7356   Jan 31 1992
                      new_clients.Jan92    39342   Jan 14 1992
```

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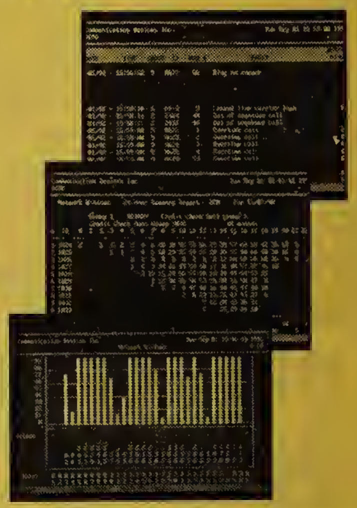

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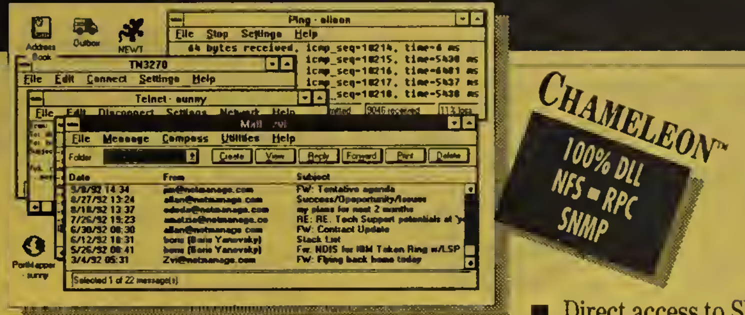

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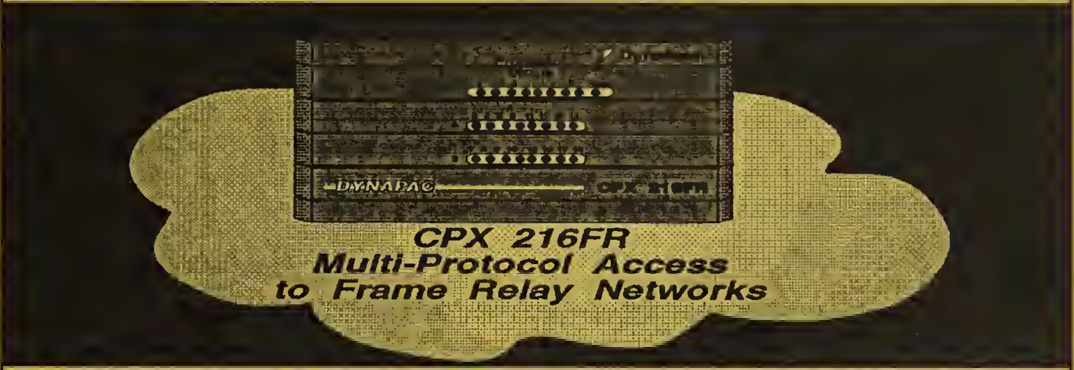

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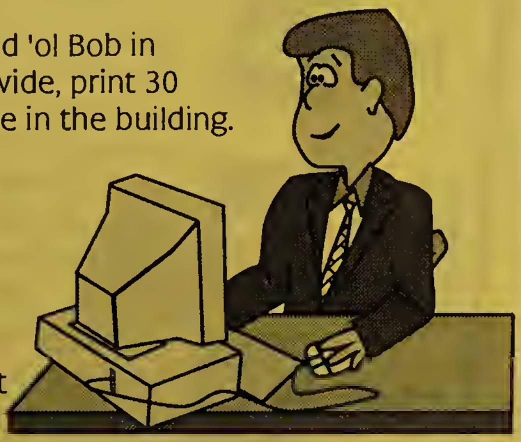

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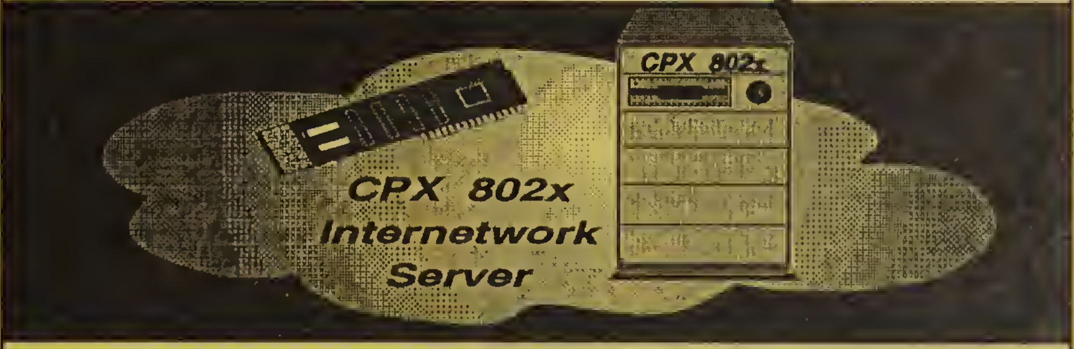

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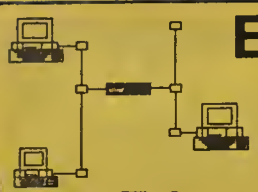

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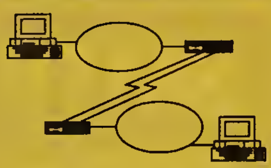

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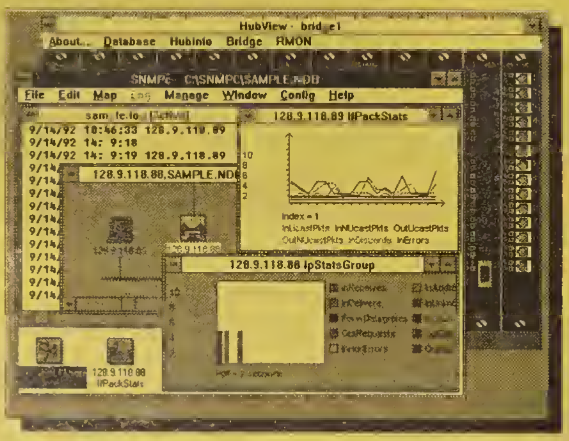
HubView - brid_e1
About... Database Hubinfo Bridge RMON
SNMPc C:\SNMPC\SAMPLE.NDB
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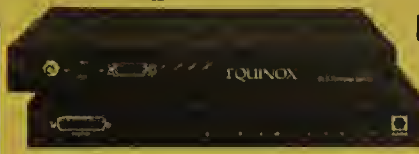

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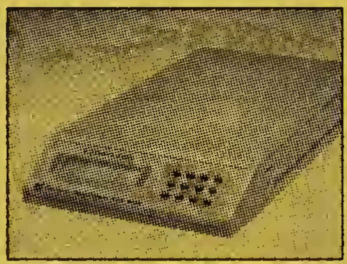

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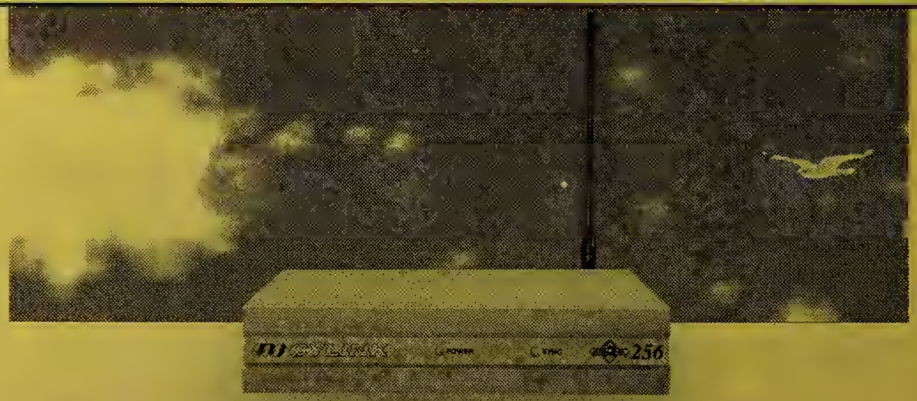

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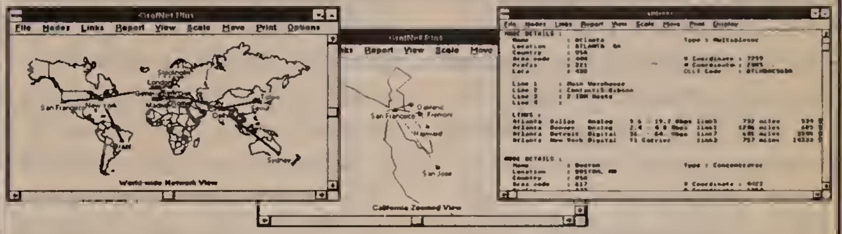

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# Router makers reach for goals

*continued from page 1*

port forwarding speeds of up to 120,000 packet/sec when it is released in March and up to 400,000 packet/sec by midyear.

Cisco and Coral both declined to comment on their respective announcements.

Sources said the Cisco 7000 will be based on a loosely coupled multiprocessor architecture and what the vendor calls a tri-bus design, which differs from the dual bus architecture of the AGS+.

It has seven slots, one of which is taken up by a board-level switch processor that handles real-time operations such as forwarding packets between the multiple interface processors.

A second board-level processor — dubbed a route processor — will handle less time-sensitive tasks, such as sending and receiving routing protocol updates and monitoring interface status.

As many as five interface boards, each with their own processor, fit into the remaining chassis slots.

On the wide area, Cisco 7000 can support as many as 40 serial connections, each at up to T-1 speeds.

By next year, the 7000 will support an interface to an external Asynchronous Transfer Mode data service unit. A native 155M bit/sec ATM interface is due out by mid-1994.

The 7000's tri-bus design will include a 533M bit/sec primary switching bus that passes data between the interface processors and a second 533M bit/sec bus for backup. The third will handle all system overhead data and interprocessor communications.

The 7000 will be Cisco's first router to offer fault tolerance — in the form of hot-swappable interface boards, an optional dual power supply and its redundant 533M bit/sec bus — minimizing the risk that the router will become a single point of failure.

## Future enhancements

Sources said the 7000 will achieve the forwarding rate of 250,000 packet/sec when it moves to a hardware-based packet switching engine in 1994.

The vendor is also expected to unveil within the next two years an IBM Enterprise Systems Connection channel interface that will enable the router to connect to an IBM mainframe at speeds of at least 10M byte/sec.

The 7000, which will support all the same protocols as the vendor's existing line of routers, costs $19,990 for a base unit that includes the route and switch processors. Interface modules will be available separately and cost between $6,500 and $22,000.

Cisco will have competition from Coral, whose BX 2000 will be equipped with an 800M bit/sec backplane that, by midyear, will be able to forward packets almost four time faster than the 7000.

The vendor is also adding support for token-ring LANs on the BX 2000, as well as expanding its protocol support to include AppleTalk and DECnet IV. The previous version, BX 1000, supports Ethernet and Fiber Distributed Data Interface, as well as the Transmission Control Protocol/Internet Protocol and Novell, Inc.'s Internetwork Packet Exchange (IPX).

The base BX 2000 costs $17,000 with interface modules priced between $4,700 and $17,000.

Nick Lippis, a principal at Strategic Networks Consulting, Inc. in Rockland, Mass., said the new Cisco router scales better than previous models and does address user requirements for redundancy in high-end routers.

But it does not provide fail-safe reliability, he said.

"Coral has the best fault-tolerant architecture because it goes all the way down to the board level so you can switch from one Ethernet board to another," he said. Neither Cisco nor Wellfleet provide the hot switch-over at the module level that is common in devices such as central office switches, he said.

"The true reliability that is common in telecommunications devices has yet to find its way into most internetworking gear, and that is something router vendors aiming at the high end need to improve," Lippis said. ◪

## Router roundup

**Cisco, Coral and Wellfleet battle for high end of market.**

| | Cisco Systems, Inc.'s Cisco 7000 Internetwork Router | Coral Network Corp.'s Backbone Express 2000 | Wellfleet Communications, Inc.'s Backbone Concentrator Node |
|---|---|---|---|
| **Backplane speed** | 533M bit/sec with 533M bit/sec backup bus | 800M bit/sec with 800M bit/sec backup bus | 1G bit/sec split among 4 256M bit/sec channels |
| **Maximum packet forwarding speed** | 110,000 packet/sec (Feb 93) and 250,000 packet/sec by 1994 | 120,000 packet/sec (March 93) and 400,000 packet/sec by June 93 | 480,000 packet/sec |
| **Chassis slots** | 7 | 10 | 13 |
| **LAN interface boards** | 5 six-port Ethernet for total of 30 | 10 two-port Ethernets for total of 20 | 13 four-port Ethernet for total of 52 |
| | 5 four-port token ring for total of 20 | 10 two-port token ring for total of 20 | 13 two-port token ring for total of 26 |
| | 5 one-port FDDI | 3 one-port FDDI | 13 one-port FDDI |
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| **Redundancy** | Hot-swappable interface boards, dual power supply and dual bus | Full redundancy on every router component | Hot-swappable interfaces, dual power supply, redundant buses |
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# Novell blesses 100M scheme

*continued from page 6*

said Novell is in complete agreement with the HP-AT&T 100M bit/sec Ethernet proposal and fully endorses 100Base-VG.

Novell recently proposed a $350 acquisition of AT&T's Unix System Laboratories, Inc. unit, a deal that would give AT&T about a 3% stake in Novell.

But the HP-AT&T scheme has come under fire because it requires a change in Ethernet's media access control (MAC) layer. It does not use Ethernet's carrier-sense multiple access with collision detection (CSMA/CD) but instead utilizes what HP and AT&T term Quadrature Signaling and Demand Priority. That scheme lets workstations utilize all four pairs of wire in Category 3 cabling to send and receive data, thus increasing the speed.

According to Clark, 100Base-VG preserves the most important part of Ethernet, its frame size, and changing the MAC layer is of virtually no consequence to users. "What's important is that the [network operating system] and the applications can run when you increase the speed," he said. "And they do."

Because 100Base-VG changes the MAC layer, it supports the same cabling and distances as 10Base-T while other solutions that preserve the MAC require shorter links from workstations to the hub, Clark said. 100Base-VG will also support cascading hubs, where techniques preserving the MAC will not.

But Douglas Spreng, vice president and general manager of 3Com's Network Adapter Division, said changing the MAC layer creates many problems for users. 3Com, together with partners LAN Media Corp., SynOptics Communications, Inc. and Sun Microsystems, Inc., will be presenting a 100M bit/sec Ethernet technique that preserves the MAC at an interim meeting of the IEEE 802.3 Committee next Monday.

Spreng said the MAC change will affect network management systems based on the Simple Network Management Protocol Management Information Base (MIB) II. "SNMP MIB II is built around CSMA/CD," Spreng said. "I don't think many people will be willing to scrap all the work involved with defining SNMP and build something new."

Users will need to buy new protocol analyzers because current protocols are embedded in the MAC layer, he said.

Spreng said he admired the "elegance" of the HP-AT&T proposal but could not support it for 802.3 because it is too different from traditional Ethernet.

"What we want to do is much like they did with token ring," he said. "Token rings can run at 4M and 16M bit/sec with dual adapters, but the basic idea of token ring isn't changed. Once you start fooling with the MAC layer, you run into problems with testing and interoperability. We just want to keep it simple." ⧉

# Software tunes nets on the fly

*continued from page 5*

ment specifications, as well as the time to pour through volumes of historical performance statistics," he said. "Even then, tuning must be repeated constantly as the network configuration and work loads change."

Opertune has two expert system software components, with the main piece residing on NCP and the other in VTAM on the host.

The NCP component collects statistics from and monitors performance of all lines coming into the FEP.

For example, it can monitor other FEPs, communications controllers, virtual routes and SNA transmission groups between FEPs. The VTAM application gathers and stores these statistics, which are also displayed in a graphical format on an Opertune monitor linked to the mainframe.

While the FEP is running, Opertune can react and automatically adjust the FEP to changing net conditions, such as increased traffic, bottlenecks and long queuing times for transactions.

By automatically tuning the FEP, Opertune can increase throughput on a multipoint line by 253% and by 74% on a point-to-point line, Schwee said. Response times can be decreased by 74% on multidrop lines and by 28% on point-to-point lines. These results were achieved using IBM's TeleProcessing Network Simulator, an IBM test package that simulates terminal, mainframe and FEP traffic, he said.

"We advise users to take the company's performance numbers with a grain of salt, but the product will let users gain control of an area they haven't had much control over in the past," said Rob Schafer, a senior research analyst with the META Group consultancy in Westport, Conn.

"Our biggest questions about Opertune are how good the logic and routines are that make the judgments inside NCP," he said.

Opertune beta users at Cooper Lighting Group, a division of manufacturing conglomerate Cooper Industries, Inc. in Elk Grove Village, Ill., have not yet measured throughput and response time improvements but said the product has removed daily NCP headaches.

"Before, we would have had to manually tune the FEPs for peak periods, which means we'd have to take the entire network down periodically," said Mark Leon, senior data communications systems programmer at Cooper. "Opertune now automatically handles the tuning and can adjust the 3745 to handle increased traffic loads."

Opertune is available now at prices starting at $10,000. ⧉

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## Scrivner preps net for APPN

*continued from page 1*

peer-to-peer network and to reduce costs."

Scrivner is beginning its net transformation at its Knoxville, Tenn., warehouse, one of 21 such warehouses the firm has located between Minnesota and North Carolina. The net configuration at Knoxville is typical of most Scrivner warehouses, featuring OS/2 Communications Manager-based Personal System/2s linked to a 4M bit/sec Token-Ring LAN. An IBM System/38 runs ordering and buying applications and is attached via coaxial cables to the PS/2s, which emulate 5250 terminals. Other Scrivner warehouses have Application System/400 hosts and Novell NetWare servers, as well.

Scrivner's strategy is to bring all of the warehouse equipment onto the Token-Ring LAN and route the traffic over its SNA backbone to the mainframe via the 6611. As a first step toward total APPN, it also wants to begin using the APPN PU 2.1 support in OS/2 Communications Manager, the AS/400s and the S/38s to build local peer-to-peer nets. APPN requires the use of PU 2.1 devices running the LU 6.2 protocol.

Bringing the S/38 onto the Token Ring was Scrivner's first challenge. Since the S/38 supports only Synchronous Data Link Control links to an SNA host it would have needed its own SDLC line to the host in Oklahoma City.

Even if it could be linked to the Token-Ring LAN, the S/38 could not communicate through the 6611 router as a PU 2.1 device because the 6611 will not support native PU 2.1 or APPN until later this year.

> Bringing the S/38 onto the Token Ring was Scrivner's first challenge.
>
> ▲▲▲

Enter Netlink. Its SDLC Link Server converts the S/38 SDLC traffic to a Logical Link Control format that can then traverse the Token-Ring LAN and be routed by the 6611. The SDLC Link Server also supports PU 2.1 devices and lets the S/38 communicate peer-to-peer locally with other PU 2.1 devices.

"The Netlink box gave us the SDLC and [PU 2.1] support we needed today so we could continue our project," Walker said. The company will add four more Netlink boxes at warehouses that have S/38s, he said.

To bring the LAN traffic across its SNA backbone, Scrivner chose the 6611 router because of its ability to handle Token Ring and NetWare's Internetwork Packet Exchange (IPX) protocol, as well as the promise of APPN support in the future, Walker said. The company also wanted to stick with IBM equipment.

So far, the company has 6611s installed in Knoxville and the home office in Oklahoma City. Walker expects to have five 6611s operational by the end of the year

As the firm is installing 6611s, it is also upgrading its existing point-to-point leased lines from 9.6K to 56K bit/sec. Usually, this would require an expensive upgrade to the host FEP, but since the 56K bit/sec lines will be terminating at the 6611, Scrivner eliminated that cost.

The 3745 scanners that support multiple low- and high-speed lines can cost from $19,000 to over $90,000, depending on how many high-speed lines users wish to support. Maintenance fees add thousands of dollars more.

"We figured for the cost of improved throughput with the 56K bit/sec lines and adding the routers, we broke even or slightly better than if we had upgraded our primary 3745 to handle 17 56K bit/sec lines," Walker said. "Between the 6611s, we expect to ultimately use frame relay so we expect a further reduction in line costs and improved performance."

Now that the Knoxville site configuration is complete, Scrivner will move on to its other warehouses. "We improved net reliability and added more throughput; we're ready to bring on more users," Walker said.

Still, Scrivner's ultimate goal is a full APPN net. Once APPN is available for the mainframe, Scrivner will implement it.

"We expect APPN to give us any-to-any communications, plus it will further distribute our applications and remove that processing from our mainframe," Walker said. "We're just laying the groundwork for the future." ☐

## NetWare goes to object level

*continued from page 1*

a uniform interface within NetWare," said John Edwards, executive vice president of Novell's Desktop Systems Group.

"Developers will finally be able to leverage the years of investment and industry work in NetWare in creating a new generation of networked, distributed applications," he said.

Specific terms of the HyperDesk investment were not disclosed, but Novell said it also gained the option to assume a seat on the HyperDesk Board of Directors.

HD-DOMS is a distributed object management system that includes an integrated set of application development tools and servies. HD-DOMS objects — reusable software components that can be mixed and matched to form applications or services — designed for use with the new HD-DOM NLM will be compatible with HD-DOMS on other platforms. HD-DOMS is currently available on Unix, DOS or Microsoft Corp. Windows platforms.

Analysts said Novell's step into distributed object computing is critical to the industry. "With

3Com's new hub is also a hub, a

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this announcement, distributed object computing enters the mainstream," said John Rymer, vice president of Patricia Seybold's Office Computing Group in Boston. "HyperDesk and Novell will be able to hide the complexity of building distributed applications for a new class of users."

**Quantum leap**

Ann Palermo, research director of office systems at International Data Group in Framingham, Mass., said, "This announcement for the NetWare platform lays the foundation for a quantum leap in the development of network services and distributed applications."

HyperDesk was one of the earliest members in the Object Management Group (OMG), a consortium of about 300 companies working to define object standards. As a result, HD-DOMS was the first distributed object management system built around the group's Common Object Request Broker Architecture (CORBA), specifications that define how objects interact on a network.

As part of the announcement, Novell — also a member of OMG — said it will do its part to facilitate the development of new distributed applications by making its core and extended NetWare services HD-DOMS-ready.

**The ORB connection**

HD-DOMS for NetWare will provide an object request broker (ORB) and repositories in the form of NLMs that will handle client requests made of back-end NetWare services.

Client applications will log on to the ORB and issue requests to object-based resources and services through the HD-DOMS standard interface. At that point, the ORB's function is to transmit the request, locate the object and bind the request to the appropriate net resource.

Since HD-DOMS has been designed with a dynamic interface, any hardware or software component, resource or service can be considered an object, and new objects can be easily added to the system at any time.

The HD-DOMS for NetWare software developers kits, which will be distributed and supported by HyperDesk, will allow NetWare developers to build any component (client or service) of a distributed, HD-DOMS-based application. A client developers' kit will also be available for those developers only needing to write client applications.

## Carriers uncover details of ATM

*continued from page 5*

As a first step toward that end, AT&T last week broke its silence on ATM, saying it will deploy a two-tier ATM switching architecture.

The carrier will use StrataCom, Inc.'s new Broadband-PX (BPX) ATM switch and the StrataCom IPX-32 fast packet T-1 multiplexer outfitted with ATM interfaces as feeder nodes for AT&T Network Systems' new GCNS-2000 ATM backbone switch.

An AT&T Network Systems official said the GCNS-2000 is based largely on an AT&T Bell Laboratories switch ("AT&T prepping user, carrier ATM switch," *NW*, Dec. 28/Jan. 4) and not the switch maker's Broadband Networking Switch-2000 (BNS-2000), which uses a proprietary cell switching scheme.

AT&T would not say when or how widely it will deploy the switches. "We will create a base infrastructure of the two switches and deploy additional ones based on customer demand," said Jayne Fitzgerald, manager of data communications services for AT&T.

WilTel, which — like AT&T and others — already uses StrataCom's IPX-32 switches to offer frame relay services, has decided to go with a different supplier for ATM.

According to Jerry Sellers, executive vice president of engineering for WilTel, the carrier will deploy eight to 10 NEC America, Inc. ATM switches to provide a nationwide ATM service that will be available "well before year end."

Sprint is the only other leading carrier that has committed to providing ATM this year, saying that it plans to offer the service by year end.

Although none of the carriers have detailed their ATM pricing strategy, Sellers said WilTel would likely use customer-specific pricing until it gets a feel for what users are willing to pay for the service.

**Sprint**

Sprint plans to use a two-tier switch architecture like AT&T's. As previously announced ("First NREN award will vault Sprint to forefront of ATM," *NW*, Aug. 24, 1992), the carrier will use a modified version of TRW, Inc.'s Space Communications Division Broadband Access Switch 2010 in order to provide ATM services to the Department of Energy and the National Aeronautics and Space Administration.

Under the terms of that contract, to be paid for with National Research and Education Network funds, Sprint will deliver ATM service to the Energy Department by roughly midyear and to commercial users by year end.

Last week, Howard Stern, director of market analysis for Sprint Data Group, said for the first time that the carrier will also upgrade its TP4900 cell relay switches, which use 130-byte cells, to support ATM. That enhancement will involve equipping the TP4900s with ATM trunk modules and upgrading the switch to break cells into the standard 53-byte ATM units. The cells would then be passed over high-speed trunks to TRW backbone switches.

MCI Communications Corp. has been relatively mum on its ATM plans.

The carrier has gone on the record saying its Siemens Public Switching Systems, Inc. cell relay switches can be upgraded to support ATM when customer demand ramps up but has refused to provide further details.

hub, a *hub*, and a **hub**.

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# NetWorld future a hot show topic

*continued from page 5*

encompass enterprise network issues. NetWorld shows have attracted more than 250,000 attendees since 1986.

While Novell officials couldn't be reached for comment, industry observers said it is unlikely that Novell will exhibit at the Networks Expo shows next year.

Novell is expected to have a major presence at the expanded INTEROP shows, which may be relocated from Washington, D.C. and San Francisco to cities with the capacity to handle bigger shows, an INTEROP spokeswoman said. Atlanta, Chicago, Las Vegas, New Orleans and New York are being considered, she said.

Adam Torres, group vice president for information technology at Bruno Blenheim, said it will be business as usual for his company next year, but its networking shows will have different names.

"It's sad the name change was the big issue here" when attendees really came to talk about new developments in networking, Torres said. He said he welcomes competition from INTEROP but blamed that company for creating confusion at the show by "promoting something that was only in the alpha stage."

An INTEROP spokeswoman said the timing of the name change announcement was largely controlled by lawyers involved in the transaction.

While Torres acknowledged that there was confusion among exhibitors at the show, he said about 75% of the floor space for 1994's Networks Expo show here Feb. 15-17 has been reserved. IBM has signed on for the show's largest space ever and Novell "shouldn't be ruled out," he said, adding, "This show is not dead by any measure."

However, there are some bad signs. Many exhibitors complained of light floor traffic, much of which might be attributable to a bad snowstorm that hit midweek, and some vendors said they probably will not sign on for next year.

"Novell pulling out would have a major impact on the show — if not next year, at least over time," said Robin Mahoney, marketing programs manager for Cayman Systems, Inc., a Cambridge, Mass., router and gateway vendor that exhibited at last week's show.

Cayman has not signed up for next year's show, but has not ruled out doing so, Mahoney said.

A spokeswoman for SynOptics Communications, Inc. also said her company has yet to sign up for the first Networks Expo show and probably will not. "We're waiting to see what some of the other vendors do," she said.

# AT&T offers mid-range deal

*continued from page 6*

ed access pay $0.1588 for calls within a 292-mile band during peak calling hours and $0.1270 for off-peak calls. Calls to sites outside the band will cost $0.1917 during peak hours and $0.1533 for off-peak calls.

Also, users will pay existing Megacom Plus rates for outbound calls using the service.

### Great timing

Analysts said the combination of 800 and other services under a single plan will help AT&T as the deadline for 800 portability draws near.

"With portability approaching and AT&T holding about 80% of the 800 market, AT&T couldn't continue to charge a high price for 800 services," said Daniel Briere, president of TeleChoice, Inc., a Montclair, N.J., consultancy. "[AT&T] has to be more aggressive in marketing 800, whether it's in the form of discounts, waived fees or credits."

Firms spending a minimum of $24,000 a year will qualify for discounts of 11% to 17%. Users that buy services under a term plan and spend $1 million a year qualify for 14% to 32% discounts.

The service marks the first time AT&T will allow users to add 800 usage with minutes from outbound service under a combination discount plan.

AT&T service representatives will work around-the-clock to handle all aspects of UniPlan, including maintenance, billing and installation questions. The carrier will provide users a single bill for services combined under UniPlan. The bill can be delivered in various forms, including CDROM, diskette or paper.

AT&T will also offer an optional personal computer-based software package that will help network managers analyze bills and summarize call details. It carries a onetime $250 charge.

With UniPlan, AT&T constantly monitors telephone lines and private branch exchanges and coordinates repairs. Technicians can also help coordinate problem resolution in instances that include local carriers and other equipment providers.

UniPlan can be ordered now. AT&T will waive the $545 onetime installation charge for outbound T-1 access and the $1,090 fee for an inbound T-1 access link to users that sign up for UniPlan before April 30.

The carrier will also give these customers onetime credits of up to 250% of their monthly outbound service usage. AT&T will give unspecified onetime credits to firms that switch from other carriers' 800 services to AT&T's toll-free offerings.

# ODS weighs big with Infinity hub

*continued from page 1*

dent of marketing for ODS.

Infinity comes in four-, seven- and 12-slot versions and contains four Ethernet backplanes, four token-ring backplanes and a single Fiber Distributed Data Interface backplane, with a total of 300M bit/sec of backplane capacity in its maximum configuration.

A fully loaded 12-slot Infinity, for example, can support as many as 62 FDDI, 384 token-ring or 576 Ethernet ports, or any combination thereof. All told, Infinity can support 44 Ethernets, 44 token rings and three FDDI rings.

That LAN support overshadows current offerings from some of the larger hub vendors. SynOptics Communications, Inc.'s LattisNet System 3000, for example, provides connectivity for three FDDI, two token-ring and five Ethernet LANs, while Chipcom Corp.'s ONline System Concentrator offers four FDDI, seven token-ring and three Ethernet LANs via its TriChannel architecture.

Racal-Datacom, Inc. will be introducing a high-density hub in the near future, but it will only support token ring, and SynOptics is developing a hub, dubbed the RubSystem, with Cisco Systems, Inc. that industry observers say will be similar to Infinity.

The Infinity also features logical segmentation and per-port and per-segment switching for token-ring and Ethernet LANs.

For example, all token-ring modules, which come in 20-, 26- and 32-port versions, can be logically segmented into four LANs that can be switched to any one of the four backplanes.

Like similar offerings from Chipcom and Bytex Corp, ODS provides per-port switching for the token-ring modules, meaning any port can be assigned to any of the four logical segments and then logically switched to another segment.

The three token-ring modules, which support either 4M or 16M bit/sec token ring, also offer beacon prevention capabilities. If a user tries to insert onto the ring at the wrong token-ring speed or with a device that is incorrectly configured, ODS' Network Protector feature will deny ring access to the device.

Also available are four Ethernet modules, which come in 18-, 28-, 32- and 48-port models and support a range of connections, including 10Base-T, 10Base2, 10Base5 and 10Base-FL.

All modules can be logically divided into four segments that can be switched to any one of the four Ethernet buses. Per-port switching is not available on the Ethernet modules.

For FDDI networks, the Infinity will support two media access control (MAC) daughterboards that control entry to the two counterrotating rings comprising the backplane. One MAC may be placed on the primary ring, while the other monitors the secondary ring. Both could also be placed on the primary ring for redundancy.

A range of FDDI modules is available, including the two-slot processor card, which houses the MAC daughterboards and 80-character LCD that allows the net manager to completely monitor and control the FDDI network from the wiring closet if needed.

There are also several of six-port user cards that can support six single-attached or three dual-attached stations. The modules plug directly into the backplane.

In order to interconnect the different LANs residing in an Infinity hub, ODS is providing integrated routing modules.

The first product in that line is the 1094-WF bridge/router module, which is based on Wellfleet Communications, Inc. Link Node technology and takes up four slots.

Routers from other companies as well as other technologies will be integrated in the future.

All the Infinity modules are hot-swappable, slot-independent and equipped with an integrated retiming feature, eliminating the single point of failure found in other products that have one retiming module for the entire hub.

The Infinity line can be managed by ODS' LanVision, a Unix- and Simple Network Management Protocol-based net management system that runs on top of Hewlett-Packard Co.'s OpenView or SunConnect's SunNet Manager.

"This is a very viable enterprise hub line, especially in light of ODS' strength in token-ring technology," said Todd Dagres, vice president of data communications at The Yankee Group, a Boston-based consultancy. "It is a force to be reckoned with and gives ODS an opportunity to gain market share. ODS has made good use of its alliances, and Infinity is one of the more price-competitive products."

Infinity is available now and pricing varies depending on configuration.

The hub chassis will range from $9,000 to $10,500, while modules will cost between $2,100 for a 12-port 10Base-T and $16,440 for a six-port FDDI card.

# Patent spat raises concerns

*continued from page 1*

the technologies at no cost because of agreements struck during divestiture.

Also, some believe the dispute could slow the introduction of new carrier technologies and chill international technology licensing deals, as well as drive up rates.

"It would be unacceptable to users if this kind of sparring interferes with the deployment and use of new technology," said Henry Levine, a communications attorney with Levine, Lagapa and Block, who represents users in the financial community.

AT&T's action comes on the heels of a suit filed by MCI last month disputing the validity of four AT&T patents supporting some but not all of these services. MCI filed its suit, officials said, because AT&T began publicly accusing MCI of violating the patents after learning that MCI had licensed most of its network technology to Stentor, a Canadian consortium of carriers. But AT&T and MCI have been sparring privately over the patents since 1988.

If AT&T prevails in its suit, "it would have a negative impact on MCI and raise costs to users," Levine said. That is because AT&T would have the right to charge a royalty of between 2% and 5% on all revenue generated through use of its patents. These costs might be passed along to users.

AT&T says it has been negotiating with MCI since 1988 for royalties of 2% on all revenue generated from the patents. AT&T has asked the court to raise that amount, claiming MCI "comes into court with unclean hands as a willful and knowing infringer of AT&T's patents."

Even a 2% royalty would cost MCI hundreds of millions of dollars. AT&T claimed that for infringing the patent on database lookup technology, MCI would have owed $10 million for 1991 alone. Some of the patent disputes date back to 1987.

AT&T attorney Joe Lazeroff acknowledged that other carriers might be violating AT&T patents but declined to discuss it further.

AT&T told the court it has struck a licensing agreement in which Sprint Corp. pays royalties for many of the same patents being disputed with MCI. A Sprint spokesman confirmed that the carrier has licensed AT&T's database lookup technology but would not specify other patents it is licensing.

MCI denies it is using any of AT&T's technologies. "This is the act of a monopolist that is wounded and wants to regain monopoly control," said Gary Parsons, senior vice president at MCI.

Carriers are not the only ones at risk in this suit. Several patent attorneys warned that users could be liable for royalties. Although she is unfamiliar with the details of the dispute, Lynn Eccleston, a patent attorney with Fish & Richardson here, said a customer with a private-line net who utilizes a carrier's database technology for call routing or other calling features could be violating AT&T's patent, for example.

Eccleston said patent holders typically seek royalties only from other firms, but they could pursue a major user. Lazeroff acknowledged that was possible. "Logically, if we say MCI is doing it, the next party is infringing also," he said.

The tricky part about uncovering a patent infringement is that, in this case, most of the disputed patents are method patents, meaning AT&T has exclusive rights to provide services in a certain way. To infringe on the patent, a carrier or customer would have to go through virtually identical steps in supporting the service, Lazeroff said. "If a customer does all of the infringing steps, that customer is separately liable as an infringer," he said.

There is no set time frame for the court to act on MCI's or AT&T's lawsuit. Attorneys said it will likely be several months or more before any ruling is made.

# IBM, Novell map DCE support

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a version of NetWare with the core DFS services built in.

According to Mason, Novell is committed to implementing the first two phases but simply may not want to go as far as embedding DCE components directly into NetWare.

Analysts say that is because there is still a fair amount of doubt about ultimate industry standardization on DCE.

"DCE represents an attractive model for distributed computing, but is it real?" asked Bob Gill, vice president of LAN communications at Gartner Group, Inc., based in Stamford, Conn.

Novell's Mason said he did not know when the NetWare DFS Gateway or any other product might be available, but he made it clear it is not likely that customers will see DCE products from Novell much before the end of this year.

IBM has already brought out DCE-compliant products with the introduction of DCE support for its AIX Unix platform late last year.

The OS/2-based products would make that personal computer operating system the second IBM platform that will be DCE-enabled.

Among the OS/2-related offerings IBM plans is OS/2 DCE Base Services. That would give users core DCE functions, such as RPCs, the client portion of the DCE directory and security services, time services and threads support.

The OS/2 DCE Cell Directory Server and OS/2 DCE Security Server provide the server portions of the DCE name service and security services, respectively.

In addition, a group of IBM enhancements would make the above components interoperable with the company's already released AIX/6000 DCE product family and provide multiprotocol transport services for 32-bit Socket I/F-to-Transmission Control Protocol/Internet Protocol connections.

The OS/2 DCE beta products are available now "to anyone who wants them," said Art Olbert, director of LAN systems at IBM's Personal Systems division, based in Austin, Texas. They are all available from IBM now for $140.

IBM's Olbert said the AIX and OS/2 products are just the beginning. "Our direction is to provide AIX clients and servers, OS/2 clients and servers, a Windows client, OS/2 LAN Server integration and NetWare interoperability," he said. "We also plan to offer DCE on our MVS and AS/400 platforms."

# Lotus details its release plans

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Notes will automatically synchronize in real-time multiple versions of the same spreadsheet, presentation or word processing file as long as those documents are equipped with a Lotus feature called Version Manager, previously code-named Chronicle. The next versions of 1-2-3 for Windows, FreeLance and AmiPro will support Version Manager.

Notes 3.0 will support new work-flow capabilities using rules-based messaging. Users can program rules to forward incoming messages to other users or databases or to send messages in response to specified events.

However, users will have to wait until the end of the year to design processes that intelligently route forms and other documents within a work group. These capabilities will be made available as a Notes companion product based on work-flow tools from Action Technologies, Inc. that consist of design, distribution and reporting modules.

Several new administrative enhancements in Notes 3.0 will make it much easier for systems administrators to manage Notes 3.0 servers and applications.

One addition lets net managers change the design of a Notes database template and have those changes automatically propagated to all descendent databases on the net.

Notes 3.0 will also allow companies to allocate different levels of naming privileges to systems administrators based on their position in the company and geographic location. On the marketing side, users will be able to purchase Notes 3.0 clients separately from servers. Lotus also plans to offer an edition of Notes 3.0 that contains one server and nine clients for well under $5,000, the current price for a 10-node Notes setup.

A second release of Notes 3.0 due out this summer will support Unix clients and servers running on IBM AIX and Sun Microsystems, Inc. Solaris operating systems, as well as the Open Software Foundation, Inc.'s Motif and Hewlett-Packard Co.'s OpenLook. Later this year, Lotus will bring out Notes 3.0 versions that run on HP's HP-UX, The Santa Cruz Operation, Inc.'s SCO Unix, Windows NT, IBM's OS/2 Workplace Shell and NetWare 4.0.

# DOD sets goals for messaging

*continued from page 6*

crypted with a public-key algorithm called the Message Security Protocol (MSP) developed by the NSA. MSP, implemented in hardware attached to a computer, encrypts the user's message before passing it to the X.400 Message Transfer Agent for transmission across the network.

Unclassified but sensitive P772 messages will be protected with software based on the Preliminary Message Security Protocol (PMSP), a new NSA public-key encryption algorithm for encryption cards or microchips in personal computers and laptops. The Defense Department has decided to make PMSP available for nongovernment use, as well.

"The allies are all moving toward X.400-based systems," said Lt. Col. James Gatewood at the Maxwell Air Force Base, Gunter Annex in Montgomery, Ala.

Gunter was selected to handle the X.400 side of the DMS procurement due to the Air Force group's success in establishing a test X.400 system with a gateway to AUTODIN, the older messaging system scheduled to be phased out by the year 2000.

Highly secure, the AUTODIN system distributes messages electronically but requires them to be printed and hand-delivered. DMS, on the other hand, will deliver messages to the desktop.

Last fall, the Defense Department asked Sterling Software, Inc. to complete a proof-of-concept demonstration of DMS by this spring. The department intends to make the demo results available to the industry. And the Air Force is seeking industry comment on its recent request for information on DMS by month's end.

"We're hoping they can look at it and say, 'these things we can add on, it will be easy, and we'll do it,' " Gatewood said. The Defense Department wants to know if P772 is compatible with existing X.400 software or whether a gateway will be needed between the two. The department wants vendor assurance that P772 products will be cost-effective. It will also set up a program for conformance and interoperability testing for DMS products.

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